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HISTORY, DISTRIBUTION AND ECONOMIC SIGNIFICANCE OF THE CELLULOSE-DESTROYING FUNGUS MEMNONIELLA ECHINATA *

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INTRODUCTION

Until late in World War II the Dematiaceous species, *Memnoniella echinata*, had remained practically unknown. There were few mycologists who had ever heard of it when, in 1944, an Australian scientific mission to New Guinea named it as a common form moving in to destroy the basic cellulosic ingredients of army tents after other fungi had already destroyed the waterproofing and other finishing materials. To be sure, the species had been discovered and described in Northern Italy some seventy years earlier. But the few records that had appeared in the meantime had been mostly incidental and had been submerged and forgotten. It therefore occasioned some surprise when continued investigation proved the species to be one of the most common forms found on cotton fabrics exposed under unfavorable conditions in the tropics.

Was its geographic range more or less confined to an area of the Southwest Pacific? Was it of general distribution in tropical regions? Or was it of widespread occurrence over the tropic and temperate regions of the world? Why had it remained so obscure during a period of one hundred and fifty years of mycological exploration of Europe and a nearly equal period of similar activity in this country? Was it fundamentally a soil organism and if so why did it not come to light in Gilman's compilation of 1945? What was its relative significance in the deterioration of cotton fabrics and other materials of similar composition or use?

The present paper is based on an analysis of samples of deteriorated fabrics received from numerous military installations, laboratory study of isolates from such samples, personal observation of two of the authors at

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military installations around the tropical belt of the world, information gained through visits to various army laboratories and research institutions in the same region as well as in this country, and on the examination of herbarium specimens.

PRE-WAR HISTORY

The species was discovered by Rivolta (24) in 1873. His specimen or specimens were taken on hay and wheat culms, presumably dead, in Northern Italy. He described the organism as *Penicillium echinatum*, and furnished in addition to the description, an illustration, which, though perhaps somewhat crude by present day standards, was, nevertheless, very characteristic and quite sufficient to show beyond a doubt that he had a member of the species as we understand the latter today.

In 1886 Saccardo (26) transferred Rivolta's species to *Haplographium* and this and such other standard European works as Rabenhorst's Kryptogamen-Flora (16) and Ferraris' Flora Italica Cryptogama (9) carried it along in that genus, solely on the basis of Rivolta's report, without providing any further information.

A long period of years passed before the species was encountered again. What seems to be the second published account appeared in 1913 in a study by McBeth and Scales (17) of cellulose decomposition by soil and air-borne organisms in Washington, D. C. Cellulose agar plates were exposed to the atmosphere of the laboratory and a clearing of the culture medium was taken as the criterion of cellulolytic activity. This species was listed as one of the fungi giving positive results. In 1918 Graff (11) reported a collection which had been taken in 1912 "on moist paper which was folded together" in Manila, and the same year Stevenson (30) included it in a check list of Porto Rican fungi on the basis of an isolation from soil at Rio Piedras. All three of the foregoing writers used the name *Haplographium echinatum*. Their specimens have not been available for examination but the species is so distinctive that there appears to be no reason for doubting the identifications. It is to be assumed that Graff's specimen, deposited at the Bureau of Science in Manila, was lost in the destruction of that institution.

In 1923, 50 years after Rivolta, von Höhnel (13) found the organism on a piece of cotton yarn in Vienna. This was the fifth recorded encounter with the species in nature. Von Höhnel overlooked the work of Rivolta and, on the basis of his own specimen, described the species again as *Memnoniella aterrima* gen. & sp. nov. A slide preserved in the von Höhnel Herbarium at Harvard University is in excellent condition and confirms the identity of his specimen as typical of the species as we now know it.

From 1926 to 1932 there was some brief mention of the species on the basis of previous literature records only. Seaver and Chardon (28) made reference to the soil isolate from Porto Rico; Thom (31) agreed with Saccardo's removal of it from *Penicillium*; Clements and Shear (8) re-

ferred *Memnoniella* to synonymy under *Hormodendrum* Bon.; and Toro (29), evidently following the Clements and Shear disposition of the various genera involved, transferred the species to *Cephalotrichum* Berk.

In 1933 Galloway (10), working with the British Cotton Industry Research Association, obtained an isolate during an attempt to revive a species of *Stachybotrys* from a heavily mildewed "cop of cotton yarn." The yarn had been kept for some years in a sealed jar. The *Stachybotrys* proved to be dead, but in the course of plating, the *Memnoniella* appeared on the agar, admittedly possibly only as an air contaminant. Galloway studied the isolate carefully, noted the previous works of both Rivolta and von Höhnel, accepted von Höhnel's genus *Memnoniella*, and following the rules of priority, made the combination *M. echinata* (Riv.) Gallow. He further noted a close relationship to *Stachybotrys*.

Hence, at the onset of the war the species had been found on only six different recorded occasions. However, in the following two or three years, but still independent of the war effort, there appeared two significant papers with records of two additional isolates of the organism.

Greathouse, Klemme and Barker (12), in a piece of work aimed largely toward the refinement of a technique for testing the amount and rate of cellulose decomposition by microorganisms, tried several fungi as test organisms and found *Memnoniella echinata*, which they (perhaps not incorrectly) called *Stachybotrys papyrogena*, less satisfactory as a test organism than *Metarrhizium* sp. (since described as *M. glutinosum* Pope and more recently reduced to synonymy under *Myrothecium verrucaria* (Alb. & Schw.) Ditm. ex Fr.) and *Chaetomium globosum* Kunze. The isolate used in this work, USDA #*1331.1*, had been made in 1938 by Dr. Harry Humfeld of the U. S. Department of Agriculture from cotton duck obtained from William H. Hooper Sons Company, Baltimore (personal communication from Dr. Paul Marsh), and which probably had been exposed in Florida (personal communication from the Company).

Following a check list by Wakefield and Bisby (32), which indicated that *Memnoniella echinata* was still known in England only from Galloway's isolate, Bisby (4) presented a paper reviewing the genus *Stachybotrys*. He commented on the closely related *Memnoniella* after examining a subculture of Galloway's original isolate. He noted that, although Galloway's work appeared reasonably accurate, the species, *Memnoniella echinata*, nevertheless, was suspiciously rare; and he inferred that he doubted the existence of such a form as a distinct entity in nature. He further mentioned the possibility that it was only a form of [the perhaps even less well established] *Stachybotrys subsimplex*, in which slime production was reduced to allow retention of the conidia in chains. In addition to Galloway's culture, he mentioned another which had been made from citrus washings in Southern Rhodesia by G. R. Bates.

Even at the time of Bisby's paper, and before the war research program began to throw new light on the species, there was ample herbarium material to establish the form as distinct and of wide tropical and subtropical

distribution. Admittedly this material was not readily accessible. The specimens were in various herbaria of this country and for the most part under such short-of-adequate determinations as "*Stachybotrys* sp." or "*Haplographium* sp." They will not be discussed at this point, since they are listed further along under the heading "Distribution and Material Examined." The regions represented were Costa Rica, Colombia, Venezuela, Brazil, China, and Ceylon. One on banana under "Locality Unknown" was possibly of Trinidad origin. In all cases the organism was on plant parts, presumably growing saprophytically. There were several instances of its having been intercepted at U. S. ports on shipments of economic plants from some of the above tropical regions.

WARTIME INTEREST

Concurrently with Bisby's paper of 1943, there appeared a Report (18) by an Australian Scientific Mission describing the extensive deterioration of military stores and equipment in the eastern part of New Guinea. It was this Report which first aroused widespread interest in the problem of deterioration of military equipment. While the report was rather general in so far as the fungi as such were concerned, and was prepared before a detailed analysis of specific organisms was possible, nevertheless the comments (p. 63) pertinent to the fungi involved were of interest. Those found most frequently on tents, tarpaulins, etc., in service were said to be species of *Aspergillus*, *Penicillium* and *Rhizopus*. It was said to be such a population as this that destroyed the waterproofing and various finishing materials, to be followed later, after the fabrics were already leaking and unserviceable, by members of such genera as *Stachybotrys*, *Memnoniella* and *Chaetomium*, which effected final disintegration of the cotton fibers. In May of 1944 Dr. C. J. Magee, mycologist and senior author of the Report, in a personal communication to Professor W. H. Weston, Jr. of Harvard University, stated that he agreed with Weston that the fungi causing deterioration in the tropics were in general those familiar in temperate regions, but warned against hasty and too definite statements, adding, "*Memnoniella echinata*, for instance, is regarded as one of the most common cellulose-destroying species in New Guinea, and I think should be regarded as a tropical species."

By the middle of 1944 *Memnoniella echinata* was receiving very frequent but more or less incidental mention in mimeographed and typewritten military reports in both this country and abroad. Such references were too numerous for review here and most of them furnished no real information. They did, however, serve to stimulate interest. Most of the knowledge we now have of the species came directly or indirectly as a part of the war effort. Australian workers (2) again mentioned it as "One of the commonest cellulose attacking fungi on material from New Guinea." They recommended it for standard tests of tropic proofing of all cellulosic materials and included it in mold mixtures used for testing electrical equipment,

paper, etc. Martin (20) found it to be one of the worst active cellulose-destroying organisms present in the soils of the Jeffersonville (Indiana) Quartermaster Depot greenhouse. At about the same time the studies which finally resulted in the preparation of the present paper were being started at the Philadelphia Quartermaster Depot.

Early in 1945 Barghoorn (3), in a preliminary survey of the fungus flora of Quartermaster fabrics exposed experimentally under various environmental surroundings in Panama to test the efficiency of protective treatments, found *M. echinata* to be uncommon and in no way significant as determined by the frequency of its appearance in culture. Later in the same year, 1945, Weston (33) reviewed in a general way the fungi that had been isolated during the war from fabrics exposed in the tropics. In a set of 1330 cultures made from fabrics exposed experimentally in Panama, members of the genera *Penicillium*, *Fusarium*, *Trichoderma*, *Pestalotia*, *Pullularia*, and *Botryodiplodia*, in that order of frequency, comprised 63% of the total isolates. *Memnoniella* was obtained only once and there was no *Stachybotrys* or *Chaetomium*. Of 280 identified cultures among a total of 1517 isolated in Florida from materials experimentally exposed there, *Memnoniella echinata* appeared two times, while there were six isolates of *Stachybotrys*. It was further noted, in contrast, that out of one thousand isolates made at the Philadelphia Quartermaster Depot from samples sent in from the Pacific, *M. echinata* appeared thirty-five times. Brien and Dingley (7), in New Zealand, investigated methods for testing preservatives of fabrics. They noted that of the various fungi isolated from fabrics in the Pacific war zone and locally, *Stachybotrys* and *Memnoniella* alone caused appreciable loss in their tests and that *Stachybotrys* was selected for further assessment testing because of its prolific production of black spores on canvas, thus making its presence easily recognizable. Klemme et al (14) tested a number of species of fungi for ability to degrade grey duck. One was *Memnoniella echinata, 1331.1*, which they were still carrying as *Stachybotrys papyrogena*. It showed moderate activity. More or less concurrently with the foregoing contributions Bisby (5) supplemented his 1943 (l. c.) paper with additional brief comments. He noted that in the meanwhile cultures and data received from Dr. Lilian Frazer of Sydney [who was in charge of the Australian Mycological Panel set of cultures from military materials] and R. M. Brien of Auckland (see above) showed that *M. echinata* "is a common fungus, especially on old cloth in certain warmer areas," that the cultures agreed with Galloway's description, and that the species, regularly producing persistent chains of conidia without slime, was distinct from *Stachybotrys subsimplex*. He added that *S. papyrogena* was still unknown. A report from India (1) indicated that *Memnoniella echinata* was commonly isolated from cotton cordage and fabrics in India. And perhaps noteworthy, also, is fig. 206 in the 1945 French text book of Langeron (15) which certainly represents *Memnoniella echinata* and not *Stachybotrys lobulata* as labeled.

The year 1946 brought forth still more information. Zuck (37), made

an interesting observation which opens the way for further genetical and cytological studies. He found that certain cultures of *Memnoniella echinata* produced also typical *Stachybotrys* spores. Branched conidiophores were found which produced on one branch the small globose *Memnoniella* spores in chains devoid of slime, and on the other branch a typical *Stachybotrys* head, i.e., a head with relatively large ellipsoid spores, not in chains, imbedded in slime. Single spore isolates employing either type of spore always reproduced the parent colony type. Zuck, working at Beltsville, Maryland, made incidental mention that *M. echinata* was frequently observed by him and his associates on cloth removed from both soil contacts and above ground exposures ranging from Wisconsin to Louisiana. He further stated that it was found regularly on fabric test specimens removed from soil burial tests using various soils from Maryland, Indiana, Michigan, and Nebraska. His conclusion was that despite limited records it was a common soil species in the United States.

Another contribution of 1946 was a highly significant one by Marsh and Bollenbacker (19) pertaining to the organic growth requirements. A total of six isolates of *M. echinata* and five of *Stachybotrys* sp. all were found to require biotin for growth. They did not, however, require any of an additional list of fifteen other vitamins and related materials. Grey cotton duck appeared to furnish an ample supply of biotin for their cellulolytic activity and growth.

Also in 1946 the senior author, largely as a result of observations on the mycological aspects of deterioration as a member of a Mission sent to the tropics to study the effects of adverse conditions on military materials, briefly pointed out (34, 35) that this species probably was encountered more frequently than any other on such materials as cotton fabrics and cardboard exposed to the weather or in damp storage. Several photographs were presented showing the general growth aspects of the organism on such materials. A contrast was drawn between the behavior of *Memnoniella echinata* and *Metarrhizium glutinosum* (since referred to synonymy under *Myrothecium verrucaria*), the former difficult to work with in the laboratory but finding field conditions quite suited to its development, the latter an exceptionally strong cellulose destroyer and ideal in laboratory experimentation, yet seldom found on fabrics or similar materials in the field. Two years later, in another paper (36), the results of the assay of eleven strains of the species were presented in a table giving also the results of similar tests of numerous other fungi. It is of interest to note that the

PLATE I. Photomicrograph of *Memnoniella echinata* from culture PQMD *421* showing apical portion of conidiophore (lower left) with whorl of phialides, basal part of conidiophore (right center), and chains of conidia with their characteristic octagonal shape in side view. Taken from a potato dextrose agar stock slant (5 grams dext. per 1.) after 24 days under room conditions and mounted in a drop of a 1–1 solution of 95% ethanol and glacial acetic acid, after which a drop of 40% glycerine was run under the cover glass. (Preparation by Mary Downing, Biological Laboratories and photo by A. Wrigley, Microscopy Laboratory, both of Philadelphia Quartermaster Depot, × 990).

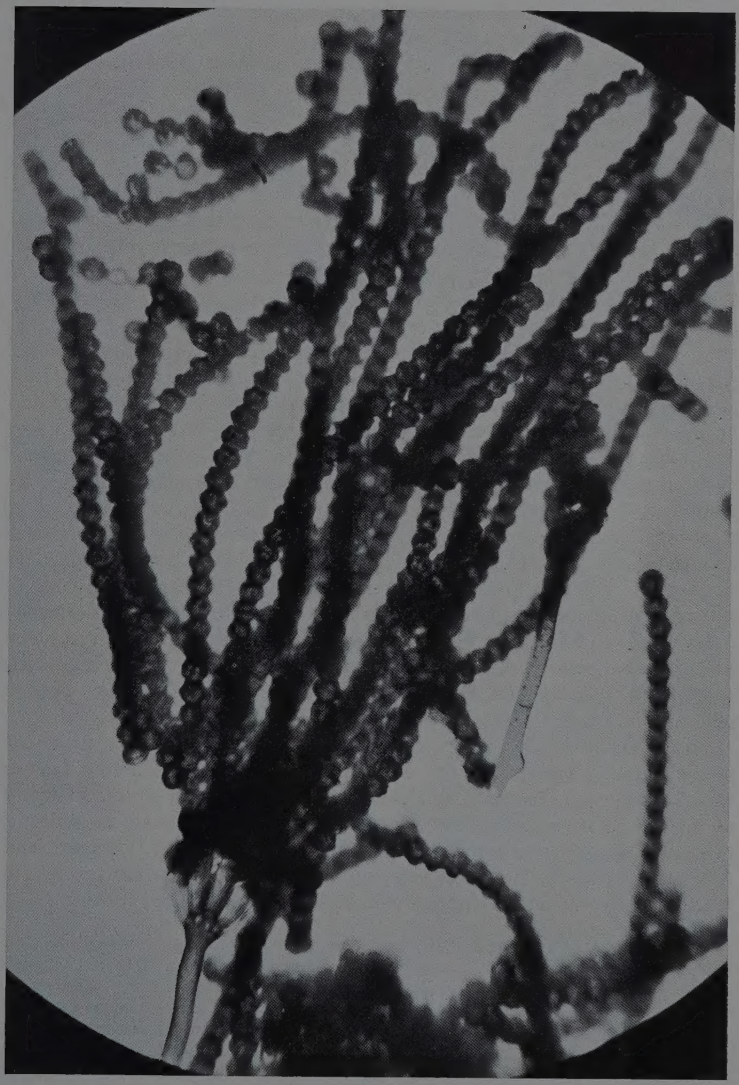

PLATE I

cultures of *Memnoniella* tested appeared to fall into two groups, those fruiting profusely at the end of a twelve-day incubation period on a relatively highly purified bleached cotton sheeting and those showing no trace of fruiting, and that those which fruited exhibited the stronger cellulolytic action. In comparison with a large number of miscellaneous fungi isolated from fabrics all the cultures exhibited strong cellulolytic action, which, however, was weaker than that obtained for species of *Chaetomium* and *Myrothecium*.

Since much of the interest in *Memnoniella* was concurrent with the period of concentrated exploration for antibiotics the species also came in for due consideration in this respect. Early in 1947 three strains of *Memnoniella*, PQMD *1c*, *50d*, & *82d* and three of *Stachybotrys*, PQMD *85m*, *94d*, & *134b* were included in a lot of fungi sent by the senior author to Dr. W. J. Robbins for antibiotic assay. They were reported upon (personal communication 3 July 1947) as not showing very great promise. The three strains of *Memnoniella* were inactive against *Staphylococcus aureus*, *Escherichia coli*, and *Mycobacterium smegma*, while the strains of *Stachybotrys* showed some activity against *Staphylococcus aureus* but were inactive against the last two. In June of the same year Brian and Hemming (6) published a series of assays which included three strains of *Memnoniella* and nine of *Stachybotrys*. All were different strains than those used by Robbins. *Memnoniella* and three of the strains of *Stachybotrys* showed no antifungal or antibacterial activity while six strains of *Stachybotrys* showed enough of one or both to warrant further study. Hence the independent findings of the two groups of workers were in rather strict agreement in setting *Memnoniella* aside as showing no promise while strains of *Stachybotrys*, on the whole, did show a certain amount of activity. It may be noted at this point that the earlier statements of Bisby (4, 5) and Zuck (37) mislead Brian and Hemming into suspecting that the two species might be identical.

Marsh's contribution on nutrition was followed closely by a similar study by Perlman (22, 23). Perlman confirmed Marsh's conclusions that *Memnoniella echinata* and *Stachybotrys atra* were similar in many of their physiological characteristics. They were able to grow in solutions of biotin, glucose and mineral salts, to utilize about twenty sugars and derivatives, to grow well with any one of several nitrogen sources and to receive some stimulation from traces of iron, zinc, and manganese. The

PLATE II. *Stachybotrys atra* (A–B) and *Memnoniella echinata* (C–G). A,B, Typical spores of *S. atra*, respectively Australian Mycological Panel *70* and *65*. C, Typical spores of *M. echinata*, AMP *2*. D,E, Mounts from *M. echinata*, AMP *52* and *86* respectively, showing typical globose *Memnoniella* spores and some elongate spores of the *Stachybotrys* type as described by Zuck. F,G, Abnormally proliferated and colored phialides of *M. echinata*, observed in only one culture, PQMD *320b*. All preparations in 7% KOH solution; A,B,D&E from 1-3 month old 0.5% p.d.a. stock slants held for a while under room conditions then at 6°C.; C, from a similar stock slant about 1 year old; F,G, from a 10-day-old stock slant, 2% p.d.a., room conditions. (All preparations and photographs by Mary Downing, F × 440, all others × 1000).

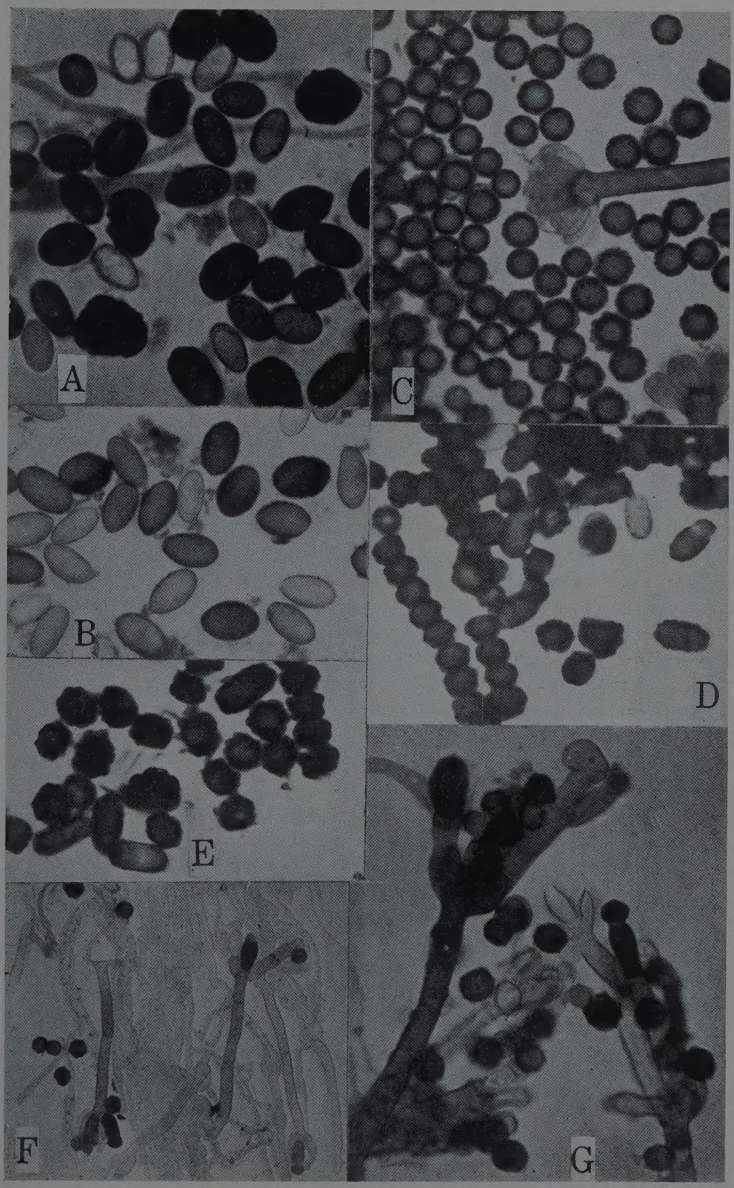

PLATE II

biotin studies of Marsh were extended and other nutritional details were presented.

Romano (25) used *Memnoniella echinata* as one of seven fungi employed in a "spore-rain" technique for testing fabrics but did not make any study of the organisms as such.

Martin (21) found *M. echinata* common on South Seymour Island of the Galapagos group and particularly abundant on dead *Opuntia* stems.

MEMNONIELLA AND STACHYBOTRYS

The morphological distinction between these two genera is that in *Memnoniella* the conidia are globose and borne dry in chains (pl. I, pl. IIC) whereas in *Stachybotrys* they are ellipsoid or typically so (pl. IIA, B), not in chains, and are held in a globular mass of slime which envelops the tips of the phialides. Biologically members of the two genera are very closely related, and in a natural, as opposed to a form-genus classification, the species would have to be considered congeneric.

Memnoniella has always been monotypic, while about 20 species have been described in *Stachybotrys*. Bisby (5) has pointed out that many of the species of Stachybotrys are superfluous, and he has already made a beginning toward their reduction. The number will eventually be reduced to perhaps 3 or 4 valid species. From the strictly economic point of view only one species of *Stachybotrys* is worthy of consideration. It could be definitely identified with the type of any one of several relatively recently described species, but conservative procedure appears to warrant continuance of the more or less generally established practice of referring these forms to *S. atra* Corda. Bisby has done this after critical consideration of the case, despite the fact that Corda's description and illustrations leave much to be desired. Corda's type specimen has never been reexamined.

Pertinent to the purposes of the present paper, then, there are two species, *Memnoniella echinata* and *Stachybotrys atra*. Among the dozens of cultures that have been available, including isolates from throughout the temperate and tropical parts of the world — some made at our own laboratory and some submitted by others — all except two or three fall nicely into one or the other of these two species. With these few exceptions, none have varied from the normal to the extent that they had to be doubtfully disposed of taxonomically, nor have intermediates been noted.

It has been found that when transfers of strains of the two species are

PLATE III. Growth patterns of *Stachybotrys atra* (A–E) and *Memnoniella echinata* (F–J). Grown in parallel series from mass spore transfers for 16 days under room conditions on potato dextrose agar (20 grams dext. per liter) with 35 cc. of the medium in standard 9 cm. petri dishes. A, culture PQMD *94d*; B, PQMD *101a*; C. PQMD *102a*; D, PQMD *104f*; E, PQMD *134b*; F, PQMD *1c*; G, PQMD *50d*; H, PQMD *50g*; I, PQMD *51a*; and J, PQMD *51f*. (By Photographic Division, Philadelphia Quartermaster Depot, × 1).

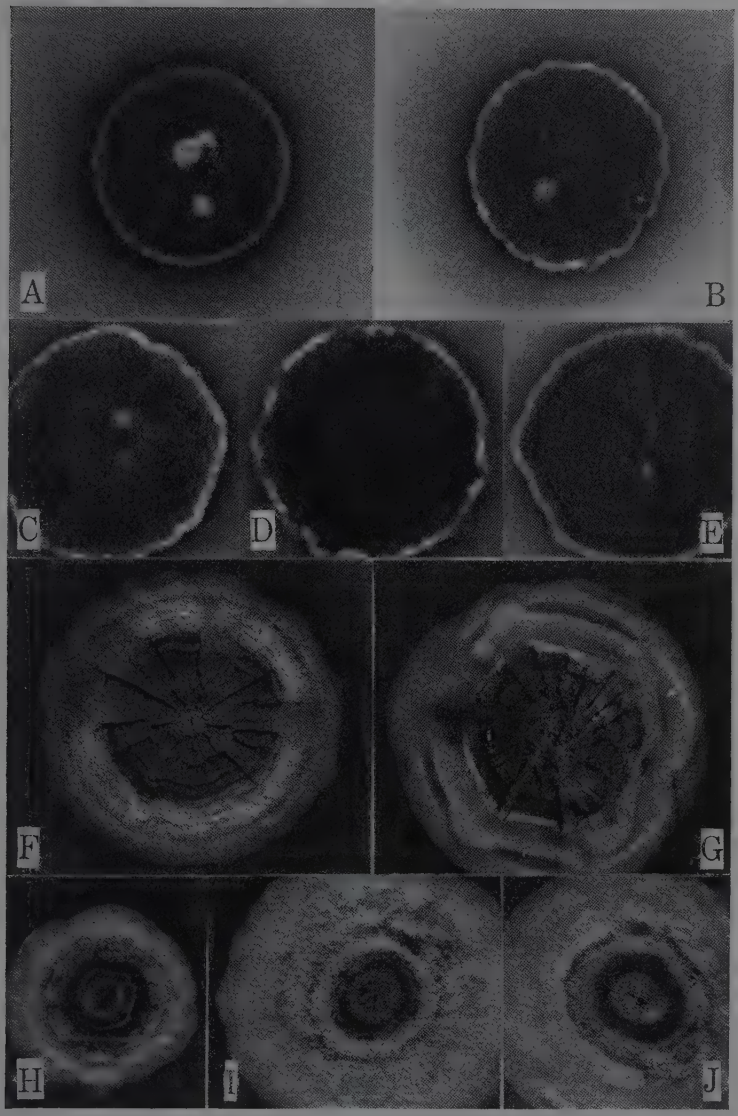

PLATE III

made from stock culture tubes to petri plates containing potato dextrose agar (20 g. dextrose per liter) the resulting colonies fall into two distinct and well defined series (pl. III). Those representing *S. atra* (pl. IIIA-E) quickly form an even, black, heavily sporulating surface surrounded by a distinct narrow white margin. This pattern is maintained until the culture eventually covers the entire surface of the agar medium. The dark halo in the agar immediately surrounding the colony is also a noteworthy characteristic. In *Memnoniella* (pl. IIIF-J) radial growth is at about the same rate, but the surface of the colony for a long time is white, floccose to watery, and sometimes wrinkled. Sporulation is relatively long delayed, finally appearing in a concentrically mottled pattern. No coloring of the agar medium occurs. There are several points of difference in the microscopic characters of the two species. In *Memnoniella* the conidia are borne in long chains (pl. I), are octagonal-globose in side view (pl. I), circular in outline in end view (pl. IIC), have a fairly dark, tuberculate outer wall (epispore) which appears to be an integral part of the body and not easily removed, are borne dry, i.e. not in slime, and measure about 5–6μ in diameter. In *Stachybotrys atra* they are extruded into a mass of slimy material to form a globule of spores and slime which envelops the tips of the phialides, are ellipsoid in outline (pl. IIA, B), vary from smooth to coarsely roughened, the latter condition being caused by the adherence of the dried-down slimy material to form a kind of false outer wall which comes off more or less readily in microscope preparations, and measure about 9–11 x 5–16μ. In *Memnoniella* the conidiophores arise singly from horizontal hyphae, whereas in *Stachybotrys* they arise alternately as branches from a zig-zag hypha, with the whole branch presenting the aspect of a loose raceme.

The observations of Zuck that in certain cultures of *Memnoniella*, typical *Stachybotrys* heads were present and that in certain cultures of *Stachybotrys* typical *Memnoniella* heads were present, the two types sometimes occupying two branches which arise from a common base, is very interesting and is a phenomenon which should be investigated further. Zuck's work, though not so intended, has raised doubt in the minds of some as to whether there really exist two distinct species. It may be pointed out here that the cultures studied by Zuck, when grown in our laboratory under the conditions of those illustrated in plate III, fall into one or the other of the two general growth patterns illustrated in plate III and also have the corresponding microscopic characters of the two species. The two types of spores (pl. IID, E) do not occur in cultures in anything approaching the order of a 50–50 ratio, which would, if this character alone were employed, cause one to wonder with which species he was dealing. In making routine examinations of stock cultures of the two species, the alternate or atypical spore is sometimes seen, but always in proportionately such small numbers — a ratio perhaps of one to several hundred, or in one slide preparation (pl. IID, E) out of many — as to cause them to be disregarded in so far as species identifications are concerned.

In specimens from the field the two species are sometimes found growing side by side or in small intermixed patches on the same piece of cardboard or cotton fabric, their favorite habitats. If the substrate is favorable, as in the case of smooth cardboard, each species in the mixed infestation may be observed to be confined to its own circumscribed area with its growth not interlocking with that of its neighbor. Neither has been observed to receive any stimulation from proximity to other fungi under field conditions despite the fact that on a biotin-free synthetic medium, *Memnoniella* at least, and presumably *Stachybotrys* also, may receive tremendous stimulation from proximity to fungi which are autotrophic for biotin. It appears that there is no shortage of biotin under the conditions of storage and exposure of cotton fabrics, cardboard, and the like.

Still another point of similarity of behavior of the two species is that on the basis of preliminary and very limited data their period of viability appears to be shorter than that which is average for the common molds. One set of tests included 46 cultures of miscellaneous molds which had been preserved from 14 to 20 months on test tube agar slants under mineral oil and held for most of the period at 8° C. Outside of *Memnoniella* and *Stachybotrys* all were viable. In the former Fla. *B-32* was living and *B-66* dead, and in the latter Fla. *B-10* & *B-31* were alive while *C-1a*, *C-10*, & *C-11* failed to revive. Another series included 39 ordinary potato dextrose agar slants which had been alowed to dry down under room conditions and were then packed in a cardboard box on a laboratory shelf until they were four years old. Two cultures of *Memnoniella*, AMP *52*, *85* were in the lot and both were among the total of eleven that failed to revive when transferred to potato dextrose agar.

RELATION OF HYPHAE TO COTTON FIBERS

The histological relationship of the fungus and the cotton fiber was not studied beyond the purely exploratory phase. The results of the preliminary work were, however, so interesting and promising that in so far as *Memnoniella echinata* was employed for the work the results are recorded here for the sake of completeness, and with the thought that they might stimulate further effort along this line.

Fibers of a non-absorbent plugging cotton were immersed for ten minutes in 95% ethyl alcohol, washed thoroughly in sterile distilled water, then spread out singly on the surface of a mineral salts agar plus yeast extract in petri dishes. Inoculations were made by touching a loop suspension of spores of culture PQMD *82d* to the agar surface just at the side of the fiber. The dishes were placed at 30° C. for a day, then held under room conditions. Hyphae reached the fibers in from two to three days, growing over and under, but not penetrating until later when the advancing hyphal tips of the colony were well beyond the fiber. At from seven to nine days the colony had thickened somewhat to form a mat of hyphae about the fibers, at which point it appeared to be stimulated to produce a

few conidiophores. Removal and proper preparation of the fibers at this time showed the central canals to be filled with hyphae. Preparation for microscopic observation consisted of swelling the wall and of staining. This was accomplished by the well known method of immersion in 11% NaOH for three minutes, washing in water, immersing in 2% aqueous Congo Red for 10 minutes, washing again in water, and finally mounting in an 18% NaOH solution.

Action on the outer surface of the fiber appeared to be highly localized, direct penetrations of the wall occurring only at widely separated intervals. Once the lumen was reached growth was rapid and the canal was soon filled with hyphae (pl. IV). The action which destroyed the fiber appeared to be from the inside. Short sucker-like lateral branches from the main hyphae could be seen extending into dissolved-out pockets (pl. IVB, IC) sometimes growing out nearly to the cuticle, while the whole inner surface was severely corroded. At such a late stage, when there must have been little or no strength left in the fiber there was no evidence, either as corrosion or change in staining qualities, of any generalized action on the outer surface.

When the colony was allowed to grow long enough it soon covered the ends as well as the central part of the fiber. Even when this happened there appeared to be no more of a tendency for the hyphae to enter the exposed ends than to penetrate the wall directly.

The evidence then is that there is local and widely spaced penetration of the wall, that following penetration there is general and rapid development — in the lumen, and that loss in the substance and strength of the fiber is the result of generalized fungus action from within.

There are difficulties to be overcome in such a study but they are by no means insurmountable. When a fiber is penetrated at only one or two points there is little to hold the outside hyphae intact during the manipulation. This is further aggravated by the fact that the swelling of the fiber wall stretches the penetration tube and causes it to break. Hence the outside hypha is lost, taking with it the outer portion of the tube and the hypha which runs through the lumen is drawn away from the wall pulling out the inner portion of the tube. In a preparation like that of plate IVB the penetration hypha appears to have been broken within the fiber wall, with the two ends having been withdrawn nearly to the opening at either side. Except for the time factor involved, and the fact that the fiber was inoculated in such a way as to prevent end penetration, there is no way to be certain whether the hypha had grown in or out through the wall in such a preparation as pl. IVA.

PLATE IV. Cotton fibers 9 days after inoculation with *Memnoniella echinata*. A, Fiber with lumen filled with hyphae, inner surface of wall corroded by fungus action, and outer surface of wall intact, × approx. 170. B, Section of same enlarged to show more detail, × approx. 900. C, Camera lucida pencil sketch showing hyphae extending through the central canal and giving rise to systems of side branches which dissolve out pockets in the cellulosic wall, × 1425. For further details see text.

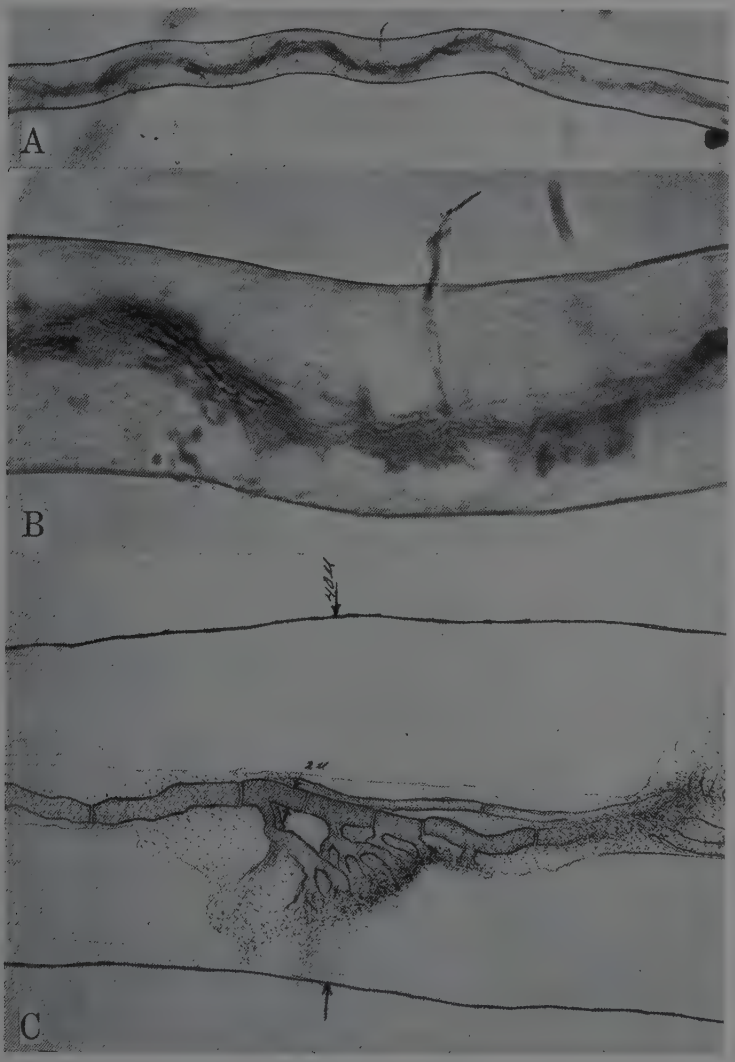

PLATE IV

Two other fungi, namely *Humicola* sp., PQMD *34e* and *Myrothecium verrucaria*, USDA *1331.1*, were tried with results similar to those described above.

DISTRIBUTION AND MATERIAL EXAMINED

To provide a basis for drawing conclusions as to the geographic distribution of *Memnoniella echinata*, types of material on which it grows, conditions under which it is active, organisms with which it is commonly associated, and its relative importance as compared with other fungi in the destruction of cellulosic materials, the following record is provided. Representative samples from the list have been placed on permanent deposit at the United States Department of Agriculture, and to a lesser extent at other institutions, where they will be available for future checking.

The samples are listed geographically in accordance with a scheme in use at the Cryptogamic Herbarium at Harvard University. Where more than one sample is listed for a geographic region, they are arranged chronologically as to collection date.

New York: Isol. from slime mold culture on moist unsterilized filter paper, Brooklyn College, 1947, *Laura A. Kolk*, Harvard *156*.

Pennsylvania: Isolated at Philadelphia Naval Shipyard in 1942 from salvage materials of unknown nature. — On unused grey cotton duck when received at Philadelphia Q. M. Depot, April 1947, from storage in an unknown region, PQMD *186*.

Maryland: Isolated at U.S.D.A., 1938, by *Harry Humfeld* from cotton duck (probably from test exposure in Florida) from the Wm. E. Hooper and Sons Co., Baltimore (USDA *1331.1*); see papers by Greathouse *et al* (12) (*Stachybotrys papyrogena*) and Zuck (37). On pieces of corrugated box taken from a cellar in Berwyn, Aug. 1947, comm. *Marsh*, PQMD *320b*, see pl. II, fig. F, G; fruiting on the same badly molded samples were, in order of prominence, *Stachybotrys atra*, *Memnoniella echinata*, *Gliomastix convoluta*, *Cladosporium herbarum*, *Scopulariopsis brevicaulis*, *Chaetomium globosum*, *Acrostalagmus cinnabarinus*, *Aspergillus* sp., etc.

North Carolina: on cloth bag in greenhouse, Raleigh, 12 Dec. 1946, comm. *Paul Marsh*, PQMD *209a*; bag used for soil shipment from unknown source; *M. echinata* most prominent, but *Stachybotrys* spores found in mounts and a very few sporodochia of *Myrothecium roridum* present. — On white cotton cloth (poplin) which became infested in laboratory test without inoculation, Cone Mills, Greensboro, spec. comm. *Marsh*, May 1947, PQMD *273a*; thoroughly mixed with *Gliomastix convoluta* and a few spores of the *Stachybotrys*-type were found.

Florida: Isol. at Univ. of Florida by *Geo. F. Weber* from Quartermaster cloth exposed experimentally, Fla. *B-32* — Ditto, canvas leggings, Fla. *B-66*. — Fruiting heavily on water-repellent khaki curtain hanging in temp.-humid chamber, Miami Marine Lab., cult. comm. *E. S. Reynolds* 30 July 1946, PQMD *183*. — On decorticated but not degummed ramie stalks in process of drying, Zellwood, July 1947, *J. D. Rebstock*. — Just above ground level on base of dead banana leaf, Key West, Dec. 1947, *W. L. White*, *PQMD 351*. — On moist under surface of an old cardboard box, Key West, Dec. 1947, *W. L. White*, *PQMD 368*. — On similar substrate, Key West, Dec. 1947, *W. L. White*, PQMD *369b*; occupying areas that were mixed with similar areas of another fungus, possibly *Stachybotrys papyrogena*.

Ohio: On paper excelsior used in shipment from San Francisco, exposed outdoors at Dayton for 1 mo., Aug. 1946, *C. C. Yeager*, PQMD *184*.

Indiana: Isol. from untreated cotton duck, Jeffersonville Quartermaster Depot, Aug. 1944, PQMD *177*. — In soil in J.Q.M.D. greenhouse, fide Martin.

Tennessee: Isol. at U. S. Dept Agr., by Humfeld, from a sample of cotton picked three days after opening at Knoxville, comm. *Marsh* (USDA *1229.2*).

Iowa: Isolated at Ames from 2 samples of parsley seed grown in California, April 1948, *Frances Meehan*, PQMD *487*, *488*.

Costa Rica: On ginger leaves collected by *Slosum*, Thaxter collection *615* as *Haplographium* sp. (Farlow Herbarium), spec. consisting of dried-down agar colonies only.

Panama: On grey cotton duck, December 1944, *E. S. Barghoorn*, PQMD *123j*; two small sporulating colonies on a small sample along with *Leptosphaeria* sp., *Tetracoccosporium* sp., *Pyrenochaeta* sp.; isol. from sample were *Cephaloporium* sp., *Brachysporium* sp., *Curvularia lanata*, *Fusarium Solani*, *Cladosporium herbarum*, *Trichoderma viride*, con. stage of *Hypoxylon*.

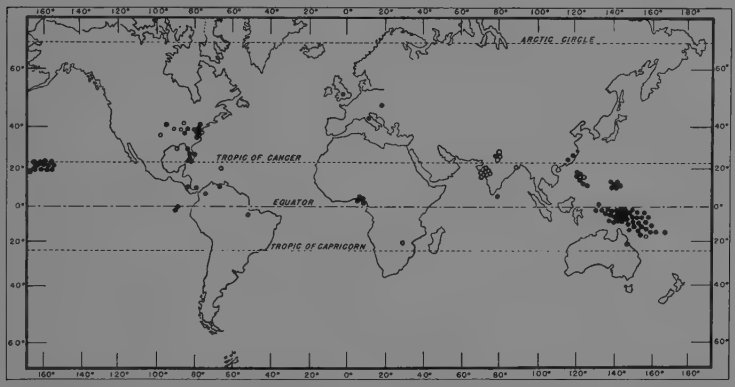

Fig. 1. Known geographic distribution of *Memnoniella echinata*. Solid dots indicate isolates or collections that have been seen and confirmed by the writers; circles indicate unconfirmed, though probably accurate, literature reports.

Colombia: On orchid intercepted at Hoboken, N. J., 13 August 1941, *D. P. Limber*, Hoboken *2076*, as *Stachybotrys* sp., (Herb. U.S.D.A.), with *Colletotrichum* sp.

Venezuela: On leaf of *Cattleya* sp., intercepted at Hoboken, N. J., 17 May 1945, *H. L. Sanford*, Hoboken *4375* (Herb. U.S.D.A.)

Brazil: On leaf of *Cattleya* sp., intercepted at Hoboken, N. J., 1 July 1941, *D. P. Limber*, Hoboken *1882*, (Herb. U.S.D.A.), with *Colletotrichum* sp.

Galapagos Islands: Cult. from dead stems of cactus, S. Seymour Isl., *G. W. Martin* (*6289*). — Cult. from litter, S. Seym. Isl., *G. W. Martin*, PQMD *242*.

Austria: "Auf Baumwollgarnfäden in Wien, . . . ," *type* slide of *Memnoniella aterrima* (Farlow Herb.).

England: Based on report by Galloway (10). Culture available but not examined.

China: on *Zingiber officinale* intercepted at Buffalo, N. Y., 14 September 1933, *W. T. Owrey*, as near *Stachybotrys papyrogena* (Herb. U.S.D.A.). — On *Zingiber officinale* intercepted at San Francisco, 2 Sept. 1941, *A. S. Johnson*, San Fr. *17796*, as *Haplographium* sp. (Herb. U.S.D.A.).

India: Isol. at New Delhi from deteriorated fabric (presumably deteriorated in India), cult., comm. *Dastur*, Apr. 1946, PQMD *176*. — See ref. 1.

Ceylon: "On Ceylon straw in laboratory" at Harvard University winter of 1892–93, as *Haplographium echinatum*, *Thaxter 634,635* (Farlow Herb.); spec. agar cult. only; data ambiguous.

Nigeria: Fruiting in many spots on under surface of grey canvas after 4 months in jungle exposure 4 ft. above ground, most abundant in vicinity of wooden supports, Port Harcourt, 12 Apr. 1946, *W. L. White*, Nigeria *1*; only organism present in sporulating condition. — From another sample, otherwise same data, Nigeria *2* — On cardboard boxes in open wooden crates in outside storage, U. S. Army warehouse and storage yard, Lagos, 18 April 1946, *W. L. White*, Nigeria *16*, sporulating extensively in pure stands on all surfaces and between layers of corrugated cardboard. — On U. S. Army service gas mask covers in wooden carton in warehouse, Lagos, 18 Apr. 1946, *W. L. White*, Nigeria *19a*, general throughout carton on both duck & webbing, assoc. with a scanty development of *Chaetomium* sp.

Australia: Isol. from canvas from Townsville by *H. L. Jensen*, Aust. Myc. Panel *52*.

Territory of Hawaii: Isol. at P.Q.M.D., Oct. 1944, *E. T. Reese*, Manila tent line, Fort Armstrong, PQMD *50d*, dominant on sample, assoc. with *Stachybotrys atra*. Isol. but not seen on spec.: *Asperg. Tamarii*, *A. niger*, *Fusarium Scirpi* var. *longipes*, & *Paecilomyces Varioti*. — Isol. at P.Q.M.D., Oct. 1944, *E. T. Reese*, tentage, Fort Armstrong, PQMD *51a;* fruiting profusely over a 20 x 12 in. sample, assoc. with *Gliomastix convoluta*; fungi isol. but not seen on material; *Penicillium chrysogenum*, *Aspergillus niger*, *Fusarium* sp., *Aspergillus ustus*, *A. Tamarii*. — On old cardboard box lying in grass in sun, Hickam Field, Honolulu, 9 Jan. 1946, *W. L. White*, Oahu *19a*, associated with *Stachybotrys atra*. — As foregoing but another box, *Oahu 22b*, also assoc. with *S. atra*. — On underside of mattress on ground in outside storage lot, Barber's Point Naval Storage Field, 10 Jan. '46, *W. L. White*, Oahu *23*, assoc. with *S. atra* & other Dematiaceae; *M. echinata* dominant and widespread through interior of mattress. — On old cardboard box on ground in sun, Barber's Point Naval Storage Field, 10 Jan. 1946, *W. L. White*, Oahu *24a*, widespread and dominant, assoc. with *S. atra*. — on under surface of cardboard box on ground, Barber's Point Naval Storage Field, 10 Jan. 1946, *W. L. White*, Oahu *25d*, small amount present among scattered patches of *Ascotricha*, *Penicillium* and *Helminthosporium*. — On grey canvas weighted container bag of an SPW3 plane in outside storage, Barber's Point Naval Storage Field, 10 Jan. 1946, *W. L. White*, Oahu *26b*, assoc. with *Alternaria* sp. which is dominant. — On canvas boot over turtle back collapsing mechanism of same plane, Oahu *27a*, assoc. with *Alternaria* sp. and *Cladosporium* sp. — On small white cardboard box on ground, Wuonae Mts., 13 Jan. 1946, *W. L. White*, Oahu *41a*, assoc. with *Cladosporium* sp. and *Stemphylium* sp. none of which were extensive. — On mattresses returned from S. W. Pacific area, 51st Quartermaster Base Depot, Honolulu, 14 January 1946, *W. L. White*, Oahu *43*, very extensive on and in a lot of mattresses returned from forward area, sent to salvage, and in process of reshipment to Manila at time of inspection, presumably having become damp in transit. — On white mattress cover in same lot with the above, Oahu *44*, growth extensive, assoc. with several other Dematiaceae, moist at time of inspection. — On and in pillow with above lot of material, Oahu *45*, extensive in pure stand.

Guam: On and in small cardboard boxes of photographic supplies contained in wooden crates in army warehouse, 4 Mar. 1946, *W. L. White*, Guam *3b*, scattered and associated with *Ascotricha chartarum*, *A.* sp., *Chaetomium* sp., & *Gliomastix convoluta*, the last being most prominent and widespread; the material obviously had become moist at some time before storage. — On grey canvas of folding cot in outdoor storage under tarpaulin, Q.M. Depot, 5 Mar. 1946, *W. L. White*, Guam *4*, occurring in numerous more or less delimited spots assoc. with non-sporulating Dematiaceae. — Another cot from same storage, Guam *5a*, occurring in numerous spots and mixed with *Gliomastix convoluta*. — On top side of white cloth bailing of Chem. Warf. protective clothing in tent storage under roof leak, Q.M. Depot, 5 Mar. 1946, *W. L. White*, Guam

11a, with *Ascotricha* sp., *Chaetomium* sp., & *Gliomastix convoluta; M. echinata* much the most prominent.

Saipan: On grey canvas army folding cot under tarpaulin in outside storage, Q.M. Depot, 7 Mar. 1946, *W. L. White*, Saipan *2a*, extensive spotting more or less mixed with *Chaetomium* sp. and a few sporodochia of *Myrothecium roridum* found. — On another cot from same storage, Saipan *3a*; *Memnoniella* spotting general & extensive, along with perithecia of *Nectria* sp.

Luzon (Manila area): On white unissued mattress cover brought in as salvage, in warehouse, Q.M. Depot 17, Zambulin, 26 Feb. 1946, *W. L. White & C. C. Yeager*, Manila *1a*, very extensive stand mixed with *Gliomastix convoluta*. — On cotton lining of asbestos glove with salvage material as in preceding citation, Manila *3*, numerous spots, other fungi not present in sporulating condition. — On winter o.d. army cap in salvage, Q.M. Depot 17, Zambulin, 26 Feb. '46, *W. L. White & C. C. Yeager*, Manila *4a*, nearly covering cotton parts in pure stand; not on wool though the latter was in a disintegrated powdery condition, a few *Ascotricha* perithecia found on the cotton. — On water repellent o.d. barracks bag, unused, otherwise as for preceding citation, Manila *7a*, growth scattered, extensive, a few perithecia of *Ascotricha* present.

Leyte (Tacloban): In pile of moist cardboard on sand beach, 28 Feb. 1946, *W. L. White*, Leyte *3a*, very extensive but not heavy, assoc. with *Gliomastix convoluta* and traces of *Curvularia* sp., *Myrothecium roridum*, and *Tetracoccosporium* sp. — On cardboard box on shelf in open side warehouse where rain had blown in, Q.M. Service Center I, Monument Beach, 28 Feb. 1946, *W. L. White*, Leyte *6a*, fruiting extensively along with *Chaetomium* sp., *Gliomastix convoluta*, & *Stachybotrys atra*.

New Guinea: Isol. from canvas, *G. C. Wade*, Australia, Aust. Myc. Panel *2*. — Isol. at J.Q.M.D., 1944, from Japanese tarpaulin from Hollandia, JQMD *309*. — Isol. at J.Q.M.D. from Japanese blanket from Hollandia, J.Q.M.D. 389. — Isol. at J.Q.M.D. from Japanese socks from Hollandia, JQMD, *421*. — Cult. from Japanese raincoat from Hollandia, JQMD *534*. — Isol. from tent fly from Port Moresby, JQMD *723*. — On canvas shoulder field bag from New Guinea, PQMD *31*, prominent on sample but not isol.; an *Aspergillus* generally distributed; isol. were *Botryodiplodia Theobromae*, *Aspergillus Sydowii* and two *Penicillia*. — Isol. at P.Q.M.D., 18 Oct. 1944, *E. T. Reese*, leather scabbard, PQMD *72i*; not sporulating on sample; surface dirty, possibly from ground; spores of many fungi but none identifiable as *Memnoniella*. — Isol. at P.Q.M.D., 25 Oct. 1944, *E. T. Reese*, unused canvas haversack, Finschafen, PQMD *82d*; white mycelium general on sample; *M. echinata* on 2 or 3 spots; isol. but not observable on sample: *Aspergillus glaucus*, *A. Oryzae*, *A. niger*, *A. terreus*, *Penicillium* sp., *Paecilomyces Varioti*, *Syncephalastrum racemosum*. — Isol. at P.Q.M.D., 25 Oct. 1944, *E. T. Reese*, canvas tentage, Finschafen, PQMD *84e*; a sample 4 x 3 in. with *M. echinata* sporulating on a spot less than 1 cm. diam. and probably *Aspergillus terreus* associated with the sewing; isol. but not seen on sample: *A. terreus*, *Penicillium citrinum*, *Pen.* sp. — Isol. at P.Q.M.D., 17 Nov. 1944, *E. T. Reese*, cotton rope, Finschafen, PQMD *87f*, not seen on sample; *Penicillia* or *Aspergilli* present in poor condition; isol.: *Penicillium citrinum*, *Aspergillus* sp. — Isol. at P.Q.M.D., 17 Nov. 1944, *E. T. Reese*, rope (hemp?), Finschafen, PQMD *88d*; spec. dusty, no mold found; isol.: *Aspergillus fumigatus*, *Fusarium diversisporum*. — Isol. at P.Q.M.D., 17 Nov. 1944, *E. T. Reese*, canvas leggings, Finschafen, PQMD *89e*; black spots general, mostly *Gliomastix convoluta* with here and there *M. echinata*; isol.: *Acremonium* sp.?, *Aspergillus ustus*, *Sporotrichum* sp., *Penicillium* sp. — Isol. at P.Q.M.D., 17 Nov. 1944, *E. T. Reese*, cotton khaki trousers, Finschafen, PQMD *90b*; undet. dark Hyphomycete scattered generally over sample but *M. echinata* not found; isol.; *Penicillium citrinum*. — Isol. at PQMD, 17 Nov. 1944, *E. T. Reese*, resin coated cloth, Finschafen, PQMD *91b*; white mycelium present but nothing identifiable as *M. echinata*; isol.: *Aspergillus flavus*, *A. terreus*, *A.* sp. — Isol. at P.Q.M.D., 17 Nov. 1944, *E. T. Reese*, canvas knapsack, Finschafen, PQMD *92i*; surface dirty and worn, mold doubtful; isol.: *Aspergillus niger*, *A. unguis*, *Cladosporium herbarum*, *Oedocephalum albidum*, *Penicil-*

lium spp. — Isol. at P.Q.M.D., 27 Nov. 1944, *E. T. Reese*, tarpaulin, Finschafen, PQMD *93f*; a small piece of material evidently in contact with ground; conspicuous organism is an old *Coniophora* or *Merulius*; isol.: *Curvularia brachyspora*, *Chaetomium funicolum*, *Penicillium funiculosum* series, *P.* sp., Ster. myc. — Isol. at P.Q.M.D., Nov. 1944, *E. T. Reese*, cotton twill trousers, Finschafen, PQMD *101b*; fairly bright and clean; no mold found; isol.: *Aspergillus terreus*, *Cephalosporium* sp., *Chaetomium globosum*, *Stachybotrys atra.* — Isol. at P.Q.M.D., 29 Nov. 1944, *E. T. Reese*, canvas & leather helmet liner, Finschafen, PQMD *102b*; in molded condition but these not identifiable on specimen; isol.: *Aspergillus japonicus*, *A. unguis*, *Penicillium chrysogenum*, *P.* sp., *Trichothecium roseum*, *Stachybotrys atra.* — Isol. at P.Q.M.D., 29 Nov. 1944, heavy web cartridge belt, Finschafen, PQMD *105b*; *M. echinata* sporulation general, superf. white myc. present; isol.: *Penicillium sp.* — Isol. at P.Q.M.D., 29 Nov. 1944, *E. T. Reese*, canvas legging, Finschafen, PQMD *106e*; spec. showing effects of wear; white myc., possibly Basidiomycetous, general; small amt. *M. echinata* sporulation in scattered spots assoc. with *Gliomastix convoluta*, isol.: *Aspergillus niger*, *Fusarium* sect. Elegans, *Cladosporium herbarum*, *Penicillium citrinum* series, *Phoma* sp. — On cotton khaki trousers, Finschafen, PQMD *107c*, mold scanty with *M. echinata* on khaki and *Gliomastix convoluta* on white lining; isol.: *Cephalosporium* and *Aspergillus.* — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, leather glove (unwrapped) Finschafen, PQMD *135a*; spec. stiff, hard, dirty; no evidence that molds isol. were other than extraneous deposits; isol.: *Aspergillus flavus*, *Penicillium* sp., *Pullularia pullulans.* — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, canvas legging (unwrapped), Finschafen, PQMD *136b*; no fungi observable on sample; isol.: *Aspergillus niger*, *A. terreus*, *Humicola* sp. — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, worn leather shoes, Finschafen, PQMD *138b*; much green mold, no *M. echinata* found; isol.: *Aspergillus flavus*, *A. niger*, *A. terreus*, *Chaetomium* sp., *Penicillium chrysogenum*, *P.* sp. — On white cotton bag holding metal aircraft parts in wooden crate in discarded outdoor supply dump. Lae, 10 Feb. 1946, *W. L. White & C. C. Yeager*, Lae *11*, sporulating over much of surface, much decay. — On cardboard box, otherwise data as for preceding, Lae *13c*; this, *Stachybotrys atra* and an *Aspergillus* generally distributed, more or less mixed but mostly on distinct areas. — On old collapsed cardboard box on ground, other data same as for preceding, Lae *19a*, not heavy but in numerous scattered patches, assoc. with *Aspergillus* sp., *Gliomastix convoluta*, and *Stachybotrys atra.* — On Lister water bag (plastic impregnated cloth, new but in salvage, Q.M. Salvage Depot, Finschafen, 13 Feb. 1946, *W. L. White*, Finch *6a*, fruiting in 3 spots, each 2–4 in. diam., assoc. with *Tritirachium* sp. — On cloth and buttons of army cotton shirt, Q.M. Salvage Warehouse, Finschafen, 12 Feb. 1946, *W. L. White*, Finch *7a*, assoc. with *Chaetomium* sp.; material had become damp in transit. — On inner layers of an old dry cardboard box, Finschafen, 14 Feb. 1946, Finch *11a*, assoc. with *Gliocladium atrum*, *Tritirachium* sp., undet. sp. — On underside cardboard box of nails on ground, Finschafen, 16 Feb. 1946, *W. L. White*, Finch *14*.

Biak Island: On tarpaulin covering machinery in outside storage, 20 Feb. 1946, *W. L. White*, Biak *10*, extensive pure stand.

New Georgia: Isol. at P.Q.M.D., 9 Feb. 1945, *E. T. Reese*, tarpaulin, PQMD *127c*; sample badly molded but *M. echinata* not identifiable as such; isol.: *Cephalosporium* sp., *Fusarium Solani* var. *minus*, *F.* sect. Elegans, *Phoma* sp. — Isol. at P.Q.M.D., 5 Feb.

PLATE V. *Memnoniella echinata* on white cotton mattress cover. Taken from a Quartermaster salvage warehouse in Manila where great quantities of similar items and clothing were being sorted out after having been collected from various places. The species was of common occurrence in the material. This cover was folded, unused, but had gotten wet at some time, at least around the marginal creases. A very small amount of *Ascotricha* and *Gliomastix convoluta* also present but none in the area of the photograph. (By Photographic Department, Philadelphia Quartermaster Depot, ×1).

PLATE V

1945, *E. T. Reese*, canvas haversack, PQMD *131c*; well molded; fruiting organisms were *Orbilia, Nectria, Dendryphium* sp.; no *M. echinata* found; isol.: *Penicillium chrysogenum, P.* sp., *Trichoderma viride.* — Isol. at P.Q.M.D., 9 Feb. 1945, *E. T. Reese*, canvas haversack, PQMD *134a*; spec. generally spotted with dark mold one of which was a *Chaetomium*; no evidence of *M. echinata*; isol.: *Aspergillus fumigatus, A. niger, A. flavus, A. Sydowi, Chaetomium globosum, C. indicum, Stachybotrys atra.* — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, top of pyramidal tent exposed 7 mo., PQMD *147d*; sample collected for a conspicuous Basidiomycetous mycelium; an undet. black Hyphomycete also found; isol.: *Aspergillus versicolor, Penicillium* sp., *Stemphylium consortiale, Verticillium* sp. — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, tent top exposed in sun 6 mo., PQMD *149a*; only species seen was *Orbilia* sp.; isol.: *Coprinus* sp.?, *Fusarium* sp., *Phoma* sp., sterile myc. — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, canvas shelter half, PQMD *155d*; badly molded, but *M. echinata* not fruiting; *Myrothecium roridum* present; isol.: *Aspergillus niger, Chaetomium funicolum*, undet. sp. — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, cotton barracks bag, PQMD *156e*; badly molded by an undet. black Hyphomycete; no *M. echinata* found; isol.: *Aspergillus flavus, Chaetomium funicolum, C. indicum, Penicillium* sp. — Isol. at P.Q.M.D., 28 Mar. 1945, *E. T. Reese*, heavy cotton web pistol belt, damp, hanging in tent, PQMD *157b*; heavily molded by *M. echinata* only; isol.: *Scopulariopsis brevicaulis.*

Bougainville Island: Isol. at Harvard Univ. June–July 1944, W. H. Weston, Jr., from tent canvas, PQMD *1c*.

Guadalcanal: Isol. at J.Q.M.D. from shoe leather, JQMD *794*. — Isol. at J.Q.M.D. from mattress cover, JQMD *1020*. — Ditto, JQMD *1043*.

Locality unknown: "From gross culture of banana skins," April 1934, *D. H. Linder* (Farlow Herb.). — Isol. from canvas, *H. L. Jensen*, Aust. Myc. Panel *85*. — Isol. from canvas, *H. L. Jensen*, Aust. Myc. Panel *86*.

DISCUSSION

From the data presented several generalizations may be made.

It is evident that *Memnoniella echinata* is a tropical species. It flourishes best in rain forests and regions of high humidity within 25 degrees of the equator. This is indicated by the instances of occurrence which came to notice during the war, and it is equally evident from an examination of less extensive pre-war literature records and herbarium specimens. Occurrence in temperate regions is sporadic and there is as yet no evidence that the species is established in such regions as Central and Northern United States, England, or Central Europe. It would be of interest to determine experimentally whether the spores are capable of overwintering in the out-of-doors in the Northern United States. The map in Fig. 1 is not to be interpreted too specifically. It will be readily understood that an organism occurring on the types of materials cited might be picked up in any part of the world as these materials are transported over the earth's surface. It seems probable that the species is even more predominantly tropical than a glance at the map would indicate. Observation in the tropics has demonstrated beyond all doubt that materials become infested after being transported to those regions and that the organism grows and flourishes and forms extensive and conspicuous black growths on the materials while they are in those regions. On the other hand the writers in only three or four instances have actually seen the fungus in sporulating

condition north of Florida. Even these infestations were in basements, greenhouses or other warm places. Other instances of occurrence are based largely on chance isolations around laboratories where materials were being brought in from regions further south. The two Iowa isolates, for example, perhaps would be more accurately cited as having come from the milder climate of California.

If the distributional data for *Stachybotrys atra* (which, incidentally, have already been assembled) were mapped as in Fig. 1, they would show that species to be fundamentally north temperate in its distribution, with a thinning out toward the tropics. The two species, i.e., *Memnoniella echinata* and *Stachybotrys atra*, are distinct, however, regardless of geography.

Memnoniella echinata is cellulose-loving. As it occurs in nature its preferences appear to be for the purest forms of cellulose, i.e., cotton materials and paper. Even the incidence of its occurrence on plant debris such as leaves, stems, etc., is not great considering the amount of collecting that has been done for fungi on such materials. In no instance has it been found sporulating on wood, plastics, leather, paint, wool, or other such materials, despite the extensive studies that were made during the war on the microbiological deterioration of such materials.

While *Memnoniella echinata* has sometimes been observed growing on tents and tarpaulins that have been erected in the field, it is doubtful if the species plays an important part in the early phases of the deterioration of such items. Even in the later stages of disintegration it is less prominent on such items than it is on certain other types of materials. Its damage is primarily to untreated fabrics in transit and storage, especially if such materials are allowed to become moist from rain. The organism thrives best in moist, dark habitats where air circulation is limited but not cut off completely. To illustrate by two specific examples, on Guam it was found growing extensively on grey canvas cots stored outdoors and covered with tarpaulins but was not on the tarpaulins, and in the same area it was found on grey medium weight fabrics stored in a leaking tent but was not among the several species of fungi that were growing and fruiting generally over the inner surface of the roof and on the sidewalls of the tent itself. One habitat in which it may always be found around army installations in the tropics is on corrugated cardboard cartons that are or have been in contact with the ground or have been held for periods in outside storage and have gotten wet. In such cases the black mold develops extensively on the bottom of the box, or between the layers of cardboard, or on cellulosic materials within the carton.

On the basis of direct examination *Memnoniella echinata* has been observed on paper and fabric materials in the tropics more frequently than any other single species. The fungi most frequently seen associated with it are, first *Gliomastix convoluta* and second *Stachybotrys atra*. The perithecia of species of *Ascotricha* and *Chaetomium* are also fairly frequent. In isolation procedures, unless special care is used, these cellulose-destroyers may become lost among miscellaneous *Penicillia* and *Aspergilli*

which may or may not be important in the deterioration process. In making isolations from such materials the black *Aspergilli* and *A. terreus* have appeared frequently on the agar but they are not often seen in sporulating condition on the molded items from which the isolations are made. There is no evidence that under field conditions any one of these organisms contribute anything toward the development of any other. Where *Memnoniella* is present on the material it usually is dominant.

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NOMINA CONSERVANDA PROPOSITA AND NOMINA CONFUSA — FUNGI

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1. NOMINA CONSERVANDA

> The principle which consists of being exact and of attributing to a predecessor only what he said, neither more nor less, ought to be a sufficient guide. — John Briquet.

Although for many years there has been a list of nomina generica conservanda proposita for the Fungi, the first fungus name has yet to be conserved. This suspension of judgment may in particular cases have resulted from uncertainty concerning the status of currently accepted names and their synonyms — uncertainty about the starting-points for valid nomenclature of various groups, the relative dates of important works, the definition of imperfect states, and other essential matters. When for one or more of these reasons it is impossible to know what names are available for a group, or whether a name is legitimate or not without conservation, it is difficult to act on proposals for conservation. A good deal of the suspension of judgment undoubtedly has been the result of inertia; but even so, it has probably prevented the official sanctioning of a number of blunders, and has to that extent been advantageous.

Not all of the uncertainty has been dispelled, but enough that critical consideration of many proposals is possible. The initiative in this work was taken by the Nomenclature Committee of the British Mycological Society, who have brought together and published a large amount of pertinent information (cited herein as BMS 1, 2, 3). Dr. M. A. Donk, Dr. G. R. Bisby, and Drs. R. Singer & A. H. Smith have contributed discussions of a considerable number of proposals, and other authors, detailed presentations of individual problems.

In the "References" at the end of this paper an attempt has been made to cite all proposals, or comments on proposals, for conserving generic names of Fungi. It would be overly optimistic to suppose such a list complete, and that pretension is not made; * since a search for proposals has been made over the last ten years, it is likely that the majority have been discovered and entered. In the pages that follow all have been discussed except those to conserve *Barya*, *Capnodium*, *Ceriospora*, *Cryptoderis*, *Cryptomela*, *Didymella*, *Dothiopsis*, *Massariella*, *Pactilia*, *Penzigia*, *Pisomyxa*, *Rhizopus*, and *Tromera* as listed in the "Supplementum" to the third edi-

* Two valuable papers by Donk arrived (IV.18.1949) while the present notes, completed for literature received through December of 1948, were in press; unfortunately they cannot be discussed here. They are (1) New and revised nomina generica conservanda proposed for Basidiomycetes (Fungi). Buitenzorg Bot. Gardens Bul. iii **18**: 83–168. 1949 and (2) Gyromitra Fr. versus Gyrocephalus Pers. (Fungi: Helvellaceae). Ibid. 169–170. 1949.

tion of the International Rules and *Ceriospora* and *Tromera* as presented by the B.M.S. committee (2 pp. 290, 283), and those incompletely presented, without discussion or nomina rejicienda, by Shear (no date).

Dr. G. W. Martin has written (in litt.), "Any proposals for conservation should do three things: (1) propose names that are clearly invalid according to the Rules; (2) have the facts stated in support of the proposal correct; (3) have the record complete." The first of these criteria clears away many obviously unnecessary proposals, like that to conserve *Agaricus* 1821 vs. *Psalliota* 1872; the third makes plain the inadequacy of most of the proposals, originally offered as bare statements of nomina conservanda and nomina rejicienda, without notes on the history and status of the names or on the case for conservation; the second underlines the need for further study not only of many of these briefly presented proposals but also of some expounded at greater length. Dr. G. R. Bisby has written (also in litt.), "A taxonomist should make every effort he conscientiously can to keep in use a name (of genus or species) that has many users, actual or potential." This is the essence of the argument for the provision (in Art. 21) for conservation. Both of these expositions of philosophy, and that of Briquet which heads this paper, have been followed to the best of the writer's ability in the present notes.

There are in general two procedures which may be adopted in considering nomina conservanda proposita. One may endeavor to learn how "many users, actual or potential," a name has — that is, its degree of currency —; and if it proves to have wide use in a particular application, to put together a case for its retention. Or one may endeavor to learn the status of a name, and the application (or applications) in which its use is permissible — that is, its availability — ; and if its use in an application for which it is available is prevented "by the strict application of the Rules of Nomenclature, and especially of the principle of priority," to determine whether "many users, actual or potential," would be benefited by its retention. The second procedure has been adopted in these notes, as permitting an economy of effort: it has seemed useless to determine the currency of a name in a particular application if, as is sometimes the case, the name should prove not available in that application.

The mechanism of conservation is provided by the International Rules of Botanical Nomenclature; and an attempt has been made to follow the Rules without aberration, including that Article (21) which sets forth the conditions under which conservation is permitted. The official edition of the Rules (entered in the "References" under Briquet, and cited throughout as IR), is now in some respects out of date, since it was amended at Amsterdam. The amendments adopted are set forth, directly or by reference to the "Red Book" (Synopsis of Proposals Concerning Nomenclature, etc.), in the first volume of the Proceedings of the Amsterdam Congress (cited herein wherever pertinent); the "principal decisions" were published also in Science ii **83**: 416–418. 1936; Jour. of Bot. **74**: 75–78. 1936; and Kew Bull. Misc. Inf. **1936**: 185–188. 1936. These amendments have

been incorporated in unofficial, but none the less useful, versions of the Rules published in 1945 by Bisby (cited as IRB) and in 1947 for the American Society of Plant Taxonomists (entered under Camp, et al., and cited as IRA). No attempt has been made to take account of any changes in the official third edition of the Rules other than those whose adoption is explicitly indicated by the Proceedings of the last Congress; the "Proposed Amendments" assembled and multigraphed by the American Society of Plant Taxonomists and the multigraphed "Supplement" to the Rules prepared by Sprague in 1948 (which, it is submitted, where it departs from the accepted text and amendments likewise has the status of a series of proposals) were in any case not available to the writer, nor to the botanical community in general, as late as September, 1948. Since it seems evident that alterations in the Rules will be adopted by the next Congress, it is strongly urged that decisions on nomina conservanda for Fungi made before the adjournment of that Congress be held subject to revision if the status of any name under consideration is, or would be, changed by authorized changes in the Rules.

Article 5 ("In the absence of a relevant rule, or where the consequences of rules are doubtful, established custom must be followed.") is sometimes cited in justification of egregious departures from the provisions of the Rules. It should be unnecessary to point out that the Article embodies a strict limitation of the principle of established custom. Article 4 ("The essential points in nomenclature are: (1) to aim at fixity of names . . .") is occasionally adduced to the same purpose. It should again be unnecessary to point out that to use a name *Quidlibet* for fungi of kind B although it was published by its author for fungi of kind A does not bring about "fixity of names," but only insures that the word *Quidlibet* shall be perpetuated as a name for something or other; * and that such misapplication violates the other "essential point" enumerated under Art. 4 ("(2) to avoid or reject the use of forms and names which may cause error or ambiguity or throw science into confusion"). A third truism is here offered: not all precedents are good precedents — not even all those supplied by Appendix III of the Rules.

Neither this nor any other set of notes on nomina conservanda is all-embracing or infallible; it is to be hoped that other mycologists will attempt further discussions, so that no proposal may be acted upon which has not been critically studied. Those who undertake such study will learn that a proposal that might have been written in two minutes and two lines may require ten hours of hard work and ten pages of heavy writing for its investigation and evaluation.

* "The first point of our nomenclature must still be to aim at fixity of names; and by what has become universal consent the correct way to do this is to trace each name to its origin. . . . The test that this has been done correctly is that whenever it is checked, the answer is always the same." — Mason, Naturalist (N. Eng.) **1948**: 7. 1948.

ACROTHECA FUCKEL vs. GOMPHINARIA PREUSS — IR p. 125; IRA p. 39.

The Fuckel citation as given, ll. cc., is inadequate and inaccurate; *Acrotheca* was published, in a paper entitled "Enumeratio Fungorum Nassoviae," in Nass. Ver. f. Naturk. Jahrb. **15**: 42. 1861. The citation of the type is erroneous; *Acrotheca* as published was monotypic, and its type must therefore inevitably be *A. Gei* Fuckel, Nass. Ver. f. Naturk. Jahrb. **15**: 43. 1861. The citation of the proposed type is erroneous in implication; the "*A. caulium* Sacc. Mich. I 75" was not in that place published in *Acrotheca* but as a "sp. nov." of the genus *Acrothecium* (Corda 1838); *Acrotheca caulium* is (Sacc.) Sacc., Syll. Fung. **4**: 276. 1886. The citation of the alleged emendation is erroneous; the proposal is to conserve "*Acrotheca* Fuck. . . . emend. Sacc. Mich. II (1880) 24"; but in the place cited Saccardo gives a short description of "*Acrotheca* Fuckel" and lists as examples the two species *A. Solani* (Sacc.) Sacc. and *A. Gei* Fuckel; since he does not for another six years so much as recognize *A. caulium* as a member of the genus, he cannot be said to have emended it in 1880 so as to make *A. caulium*, even for him, eligible for designation as type.

The only proposal which could be entertained here would be to conserve *Acrotheca* Fuckel 1861 — Type: *A. Gei* Fuckel — vs. *Gomphinaria* Preuss. Since there is no way of knowing whether such conservation would achieve the ends considered desirable by the author of the published proposal, it is desirable, or perhaps even necessary, to reject it and to dismiss the matter unless a new motion, in order, is offered.

ACROTHECIUM SACC. vs. CORDANA PREUSS and CACUMISPORIUM PREUSS — IR p. 126; IRA p. 39.

There is no such genus as the one proposed for conservation. *Acrothecium* is listed, ll. cc., as "Sacc. Mich. II (1880) 29." If that citation were correct, *Acrothecium* Sacc. would be a later homonym of *Acrothecium* (Corda) Lév., and if retained would have to be conserved against Léveillé's genus. But in point of fact there is no *Acrothecium* Sacc. 1880; what Saccardo describes, l.c., is "*Acrothecium* Corda." *Acrothecium* was published by Corda in Icon. Fung. **2**: 10. 1838 as *Trichothecium* subg. *Acrothecium* Corda, and was monotypic: "*Tr. Acroth. parasitans*" is the type. It was treated as a genus by Léveillé, Considerations Mycologiques p. 131. 1846 ("Extrait de" d'Orbigny, Dict. Univ. d'Hist. Nat. **8**: 494. 1847), and by Preuss in Linnaea **24**: 110. 1851. Though neither transferred *T. parasitans* to *Acrothecium*, as the type of the subgenus that species must be also the type of the genus.

The only proposal which could be entertained in this matter would be to conserve *Acrothecium* (Corda) Lév.. 1846 vs. *Cordana* Preuss and *Cacumisporium* Preuss 1851. If the three genera are actually synonymous, conservation of the earliest is unnecessary; if they are not, the proposal is impossible. It should be rejected.

The proposal to conserve "*Acrothecium* Sacc. 1880" implies the most

important principle at stake in the consideration of and action on nomina conservanda proposita. Parallel proposals appear elsewhere. The general situation, briefly, is this: A genus has been described for certain species. Another author has misapplied the name, adding to the genus species not congeneric with its type or, it may be, with any species included by the author of the genus. The misapplication of the name has gained a degree of currency. It is then proposed to postulate that the author who misapplied the earlier name actually published thereby a new genus, to attribute the genus to him as of the date when his error was published, and to conserve the name of the genus thus ex post facto erected against the validly published original name.

The argument for such an anomalous procedure is that the erring author has deluded others into following his error, and that a way should be found to make right that which is wrong, in order that those others may be afforded justification for persisting in error. The arguments against such a course are many, but they mostly boil down to a maxim enunciated by Briquet (Vme Congr. Int. Bot. Cambridge 1930 Rec. Synopt, vi.): "Le principe qui consiste à être exact et à ne faire dire à un prédécesseur que ce qu'il a dit, ni plus, ni moins, doit suffire comme guide conducteur." The sentence deserves to be printed, in the three languages of the Rules, at the head of all lists of nomenclatorial proposals. In the general situation under consideration the first author published a genus to embrace certain species. His diagnosis may have been at fault, or the species may have proved, under later examination, to be unrelated; but it is clear that he said, in effect, "I publish this genus for these species." However much redescription or redelimitation may be necessary, it is then accurate to attribute the genus to him. But the second author had no intention of publishing a new genus nor any idea that he was doing so. In fact, he did not do so; he merely listed under an earlier name (for which he correctly cited the author) species which later examination shows not to belong to that genus. To say that he published a new genus, and to write it genus *Quidlibet* Auct. II when Author II himself was writing (more or less competently) of *Quidlibet* Auct. I, is far from exact, and is making a predecessor (Author II) say much more than he ever actually said.

These are the conflicting principles. The practical results of the two courses of action are similar to those brought out in the discussion of Art. 54 at Amsterdam (Zesde Int. Bot. Congr. Amsterdam Proc. **1**: 347–354. 1936). There the question was whether a new combination should be attributed to the first author who published it, even though he misapplied the name, or to the first author who gave a correct circumscription of the species. Under the second alternative it would be necessary to attempt to study not only the type specimen of the original name, but also the specimens of those who had successively used the original epithet in combination, in order to discover which combinations were published with a "correct circumscription." And since opinions would vary concerning the correct circumscription of many species, the author and date of new combi-

nations would also vary according to taxonomic opinion. Since the dates would vary, the legitimate name for a species, determined by priority, would likewise vary. The problem arising out of attributing genera to the authors who misinterpreted them would be as overwhelming. How many genera *Thelephora* are there? or *Sphaeria*? or *Mucor*? One of each, or as many as there are authors who have emphasized in their writings characters or species not possessed by the types (whatever they may be)? Schroeter described *Tulasnella* for one species; Rick described the genus and three species, all new and none, apparently, congeneric with Schroeter's; Clements & Shear characterized the genus (in a key) so as to include only species of *Sebacina*, and designated an alien species as genotype. Must a student of *Tulasnella* deal with *Tulasnella* Schroet., *Tulasnella* Rick, and *Tulasnella* Clements & Shear? There was considerable discussion at Amsterdam over what to do with misapplication of names, and it was held that "misapplications of names should not be included in synonymy." (Proc.**1**: 344–345, 363–364.) Perhaps in order to expand the already ample field of labor of taxonomists, they are being asked to accept the answer: misapplications of names are to be treated as valid publication of new taxonomic entities.

There is more that is pertinent to the question, in the Rules and in the writings of taxonomists. Art. 45: "The date of a name or epithet is that of its valid publication." Art. 46: ". . . it is necessary to cite the author who first published the name in question." Art. 47: "An alteration of the diagnostic characters or of the circumscription of a group without exclusion of the type does not warrant the citation of an author other than the one who first published the name." (For discussions and citation of the amendment adopted at Amsterdam, see notes under *Phoma*.) It is submitted that in the example just given, of the genus *Tulasnella*, Rick did not exclude the type merely by failing to include it; otherwise almost any treatment of only a part of the species of a genus may exclude the type; and that although Clements & Shear's key would exclude all genuine members of the genus they did not by their erroneous characterization exclude the type in the sense of the Rules — any more than Fries excluded the type of *Agaricus* by attributing asci to the genus, or of *Tremella* by describing the Tremellinei (1849) as having "monosporous sporophores"; "exclusion of the type" here must mean explicitly removing the type [species] from the [generic] group, if it means anything. Art. 50: "An alteration of the diagnostic characters, or of the circumscription of a group, does not warrant a change in its name . . ." — and under Art. 46 the author who first published a name must be cited. And finally, there is no provision anywhere in the Rules for the invention of names in order that they may be conserved; presumably no one considered such a procedure possible. That these interpretations of the Rules are elsewhere accepted can be made clear by a few examples: "*Torula* sensu Turpin = *Torulopsis*. . . . Turpin (1838) did not make a new genus." (Ainsworth & Bisby 1943 p. 300, 1945 p. 320; cf. also Bisby p. 83.) "It is wrong to cite as a

synonym, for example, '*Dothiora* Berk. non Fr.', for Berkeley did not make a genus *Dothiora* by adding to Fries's genus a species that did not belong there." (Bisby p. 47.) "Since the adoption of the type-species method of fixing the application of generic names, [this] proposal appears unacceptable. The monotypic *Carlia* Rabenh. cannot become another genus as the result of the addition by Bonorden of two further species. . . . *Carlia* Bon. . . . has no valid existence." (BMS 1 p. 219). It is submitted that "monotypic" is here not an operative word; the statement is a truism, whether *Carlia* Rabenh. was published for one species or a dozen. It is further submitted that since "*Carlia* Bon. . . . has no valid existence." the interpolated sentence (l.c.) "*Carlia* Bon. could only become a valid genus if it were conserved against *Carlia* Rabenh." is inacceptable; conservation is not a means of bringing names into existence, but of retaining existing names. That the procedure under discussion is actually held to involve the bringing into existence of new names is, however, shown by the following quotations: "The pith of the proposal is to replace the real type species of *Hypospila* Fr. (*H. inustum*) by *H. pustula* (Fr.) Karst.; that is, to make a new genus *Hypospila* Karst., and to conserve it against *Hypospila* Fr. (1825) and *Phoma* Fr. (1823)." ". . . It is recommended that a genus *Hypospila* Karst. be not erected." (BMS 3 pp. 284, 285.) It would be curious to observe the nomenclatural consequences if a genus *Hypospila* had been erected by someone in 1940 (when the B.M.S. committee recommended against it) and subsequently conserved. The author of the genus so erected could not be Karsten, of course, but would need to be the one who erected the genus, or at most "Karst. ex Auct." (Art. 48). Some species published in *Hypospila* Fr. would have to be transferred to *Hypospila* Auct. non Fr., and since if the familiar epithets were used "the resulting binary name[s] [would be] later homonym[s]" (Art. 54) they presumably would have to be replaced by newly created binomials.

Briefly, it is submitted that the treatment of misapplications as publication of new groups is contrary to the Rules and to "established custom," would greatly increase the labors of taxonomists, and, to return to Briquet, violates "the principle of being exact," which is "the only ethical principle which has made science possible" (quoted by Sayers, D., in *Gaudy Night* ch. 17). Mycologists who have used *Acrothecium* for the wrong fungi can learn to use it for the right ones, and can learn the right genus for the false acrotheciums. (For an essay embodying this philosophy, see Fernald in Rhodora **50**: 247–249. 1948.)

AGARICUS FR. vs. PSALLIOTA QUÉL. and PRATELLA GILL. — IR p. 123; IRA p. 39; Donk 1941 p. 182; BMS 3 p. 289; Singer & Smith 1946 pp. 247, 291; Wheeler.

As pointed out by all the authors here cited, and as is apparent from the dates of the genera in question, *Agaricus* is valid without conservation. The proposal can legitimately have no other effect than to burden the literature, and should be rejected.

Psalliota (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5**: 139 and in Ch. Jura Vosges 107. Cf. note under *Flammula*.

ALBUGO PERS. EX GRAY and CYSTOPUS LÉV. — Ramsbottom 1916 p. 77; Wakefield p. 242; Fitzpatrick p. 192; Rehder et al. p. 421; Ainsworth & Bisby 1943 p. 80, 1945 p. 86.

Cystopus Lév., Ann. Sci. Nat. iii **8**: 371. 1847, antedates *Cystopus* Blume, Fl. Jav. Nov. Ser. 69. 1858, and so is unaffected by the existence of the homonym. It is, however, long antedated by *Albugo* Pers. ex Gray, Nat. Arr. **1**: 540. 1821. This latter name has been excluded by some authors (e.g. Ainsworth & Bisby) on the grounds that it is pre-Systema. In the sense of being published after the beginning of the Systema of Fries it is clearly post-Systema. In the sense of being published before the "group" in question was "first treated in the Systema" (Ramsbottom, Brit. Mycol. Soc. Trans. **18**: 315. 1934) both *Albugo* and *Cystopus* — and all other names for the group until the end of time — are pre-Systema; for the group was never treated in the Systema at all (Ramsbottom). It thus presents one of the difficulties of the multiple-starting-point interpretation of Art. 20(f) advocated by some authors. It is maintained by the present writer that *Albugo* is a legitimate name from its 1821 publication by Gray; but that is a matter to be argued more fully elsewhere; all that need be observed here is that *Albugo* is not definitely excluded by the starting-point Rule. *Albugo* might also be excluded under Art. 57 (the former Art. 49 bis). Ramsbottom writes (p. 79) that "the oospore stage was first described by de Bary"; and since he recognizes the applicability of the perfect state Rule to Phycomycetes (cf. Rogers 1948 p. 247), he considers the valid name for the group to be *Cystopus* de Bary 1863 (which is antedated by *Cystopus* Blume 1858), and that "the specific names must begin with de Bary."

This seems to be a good argument from a doubtful premise. As already noted in connection with the controversy concerning *Milesia* and *Milesina* (Rogers 1948 pp. 250–251), "the type . . . of a generic name is a species, that of the name of a species . . . is usually a specimen" (Art. 18). The applicability of *Albugo* and of *Cystopus* Lév. to the perfect state depends not on whether the authors who published them recognized the presence of oospores, but on whether oospores were present in their specimens. To argue otherwise would be to discard, as names applied to the imperfect state, all names applied to Basidiomycetes without recognition of the presence of basidia — i.e., most names published before 1837, and many later ones. It seems reasonable to suppose that at least a part of the material that Persoon (or Gray) and Léveillé had in hand contained oospores, even though the authors did not describe them. It is therefore submitted that their names are not rendered "of only temporary value" by Art. 57. If the probability can be shown, by those well aquainted with the fungi in question or with authentic specimens, that the authors did not have oospores in their material, Ramsbottom's conclusion of course supersedes the one offered here.

There appears to have been no formal proposal for the conservation of the name *Albugo*. Even so, the possibility of its retention has been so many times discussed (in print or elsewhere) that it has appeared useful to examine the question. The conclusion offered is that *Albugo* is not rejected by the existing Rules. If it is rejected by modifications hereafter adopted, or from study of original specimens, it would seem better to use *Cystopus* Lév. than to attempt special action in the matter; and only if both *Albugo* and *Cystopus* Lév. are shown to be inapplicable under Art. 57 to conserve *Cystopus* Bary vs. *Cystopus* Blume. But conservation is neither proposed here nor recommended.

ALEURODISCUS RAB. EX CKE. vs. CYPHELLA FR. — Donk 1941 pp. 156, 159.

The author of this proposal gives a number of cogent reasons for considering *Cyphella digitalis* the type of *Cyphella*. To these may be added another: (5) Corda (Anleit. Stud. Mykol. 154. 1842) definitely designated it as the type: "wir betrachten *C. Digitalis* als Normart. . . ." It seems quite clear that *C. digitalis* is the type of the heterogeneous *Cyphella* Fr.; it is even clearer that *C. digitalis* is an *Aleurodiscus*. Since nothing but confusion could be achieved by calling all present *Aleurodisci* by the name *Cyphella*, the proposal should be adopted — with one correction: the date of publication of *Cyphella*, Syst. Mycol. **2**: 201, is 1822, not 1823.

AMPHISPHAERIA CES. & NOT. vs. SPHAEROPSIS LÉV. — BMS 2 p. 288.

On the showing of the B.M.S. committee, *Amphisphaeria* Ces. & Not., Soc. Crittogam. Ital. Comm. **1**: 223. 1863, was published for eighteen species including the type of *Sphaeropsis* Lév. 1842 (q.v.); the name *Sphaeropsis* is then the valid one for the genus. Since, however, *Sphaeropsis* is so much better known in its misapplication by Saccardo, its use for the species of *Amphisphaeria* would make it "a permanent source of confusion or error"; it should then be rejected as a nomen ambiguum under Art. 62. If that course be taken *Amphisphaeria* seems to be available for the genus. But *Amphisphaeria* is illegitimate under Art. 60(1) as amended at Amsterdam (see citation under *Sordaria*), being "nomenclatorially superfluous when published," and can be revived only by conservation. It is recommended that the proposal be adopted.

APIOSPHAERIA SACC. vs. CONIOTHYRIUM CORDA — IR p. 124; IRA p. 39; BMS 2 p. 287.

There is no *Apiosphaeria Sacc.*; in the place cited in the proposal one finds only a brief description of the genus *Apiosphaeria* Berk. (see discussion under *Acrothecium*). Even if Saccardo had in that place erected a genus *Apiosphaeria*, it could not be typified, as is proposed, by *A. pinea*; the only species which Saccardo mentions is "*A. Pulviscula* S." Finally, "*A. pinea* Sacc. Mich. I 126," the proposed type, is itself a fiction; one finds rather, l.c., *Phoma pinea* Sacc. *Apiosphaeria pinea* (Sacc.) Sacc., Syll. Fung. **3**: 169. 1884, was published too late to be the type of an 1880 Sac-

cardoan genus, and, *a fortiori*, of an 1860 Berkeleyan genus. The only proposal that could be entertained is to conserve *Apiosphaeria* Berk. 1860, with one of Berkeley's species as the type, against *Coniothyrium* Corda 1840; since it is not evident that this would accomplish any desired end, the proposal should be rejected. See notes under *Coniothyrium*.

ASCHERSONIA MONT. vs. ASCHERSONIA ENDL. — Donk 1941 pp. 159, 182.

Donk points out that *Aschersonia* Endl. (a renaming of *Laschia* Jungh. non Fr.) embraces two species neither of which at present appears to need a genus of its own, and has never had any currency, whereas *Aschersonia* Mont. of the Fungi Imperfecti is widely used and of some importance. There seem to be no obstacles to the proposal, whose desirability should be investigated by students of the imperfects. See also notes under *Hymenogramme*.

AURICULARIA BULL. ex SECR. vs. AURICULARIA BULL. ex FR., AURICULARIA WAHLENB., and LASCHIA FR. — Donk 1941 pp. 156, 160; Martin 1943.

If, as Donk asserts, *Auricularia* Pers., Mycol. Eur. **1**: 97. 1822, is pre-Friesian and invalid, some such proposal as Donk's (given above) would probably be found desirable. If, as Martin contends, *Auricularia* is validly published by Persoon, the motion is useless. Since Martin's case has the support of the existing Rules, the proposal should be shelved, to be revived only if alteration of Art. 20(f), the starting-point rule, excludes his interpretation and makes necessary the conservation (or rejection) of *Auricularia* as currently used. See also notes under *Stereum* and *Hirneola*.

CALOCERA (FR.) FR. and CORYNOIDES GRAY. — Doty p. 129.

No proposal for conservation of *Calocera* seems to have been offered, nor is one made here; since the possibility of conflict exists, the matter is here discussed. Since Fries published *Calocera* only as an infrageneric group in 1821 (Syst. Mycol. **1**: 463, 485) and did not raise it to generic rank until 1825 (Syst. Orb. Veg. 91), it is antedated by *Corynoides* Gray, Nat. Arr. **1**: 654. 1821. Gray's genus included four species: *C. cornea* (= *Calocera*), *C. fabarum* (based on Sowerby's pl. 404 and later named *Merisma pusillum* Pers., Mycol. Eur. **1**: 158. 1822), *C. farinosa* (= *Spicaria* or *Isaria*), and *C. byssoides* (= *Ceratiomyxa fruticulosa*). Since *Corynoides* antedates the generic names *Calocera*, *Spicaria*, and *Ceratiomyxa*, to select the first, third, or fourth of Gray's species as the type would necessitate the rejection of a well-established name. The status of *C. fabarum* Gray is quite different. Gray cites Sowerby's Tab. CCCCIV as "*Clavaria fabae* Sowerby"; but where, or whether, that name was published is not apparent. Sowerby's text refers to the plate as representing "*Clavaria rugosa*"; since his material occurred on bean-stalks (*Faba*), it seems likely that Gray actually referred to that plate. Plate 404 is certainly not the same *C. rugosa* as that shown in Pl. 235, the type of *Clavaria ceranoides* Pers., Syn. 594, ex Fr., Syst. Mycol. **1**: 481. Cotton & Wakefield, Brit. Mycol. Soc. Trans.

6: 164–198, refer to neither *Clav. fabae* nor *Corynoides fabarum* nor to Sowerby's Plate 404. *C. fabarum* seems to be a species completely lost; and as such it is an admirable lectotype for a generic name whose discovery could be so useless and inconvenient. If *Corynoides* has not already been validly typified (cf. Ainsworth & Bisby 1943 p. 73, 1945 p. 79), *C. fabarum* is here designated as its lectotype. Perhaps then *Calocera* will remain undisturbed. The essentials of this discussion have been accepted by Doty.

CALODON (QUÉL.) KARST. vs. HYDNELLUM KARST. — IR p. 123; IRA p. 39; Donk 1941 p. 183.

Miller (Mycologia **25**: 300. 1933) treats the listing of the name *Calodon* Quél. in Clav. Hym. as valid publication; Donk, following Banker, treats it as a tentative name, published, l.c., only as a synonym of a section of the genus *Hydnum*. Examination of the Clavis Hymenomycetum seems to bear out the judgment of Banker, Donk, and the author of the proposal under consideration, that *Calodon* had no nomenclatorial standing until after the publication of *Hydnellum*. (*Hydnellum* is usually cited from the reprint; according to the complete volume, it was published in Soc. Faun. Flor. Fenn. Medd. **5**: 41. 1880.) Donk rejects the proposal on the grounds that among those recognizing the segregate genera of stipitate Hydnaceae there is no unanimity in favor of *Calodon*, and that to the majority of mycologists, who are still employing *Hydnum* for all stipitate species of the family, the choice between the two names is a matter of indifference. To these may be added the observation that it is by no means certain that *Calodon* and *Hydnellum* are synonymous, nor that they will not both be maintained, for different groups. It is recommended, as by Donk, that the proposal be rejected.

CALVATIA FR., Summ. Veg. Scand. 442. 1849 — Type: *Bovista craniiformis* Schw. — vs. LANGERMANNIA ROSTK. in Sturm, Deutschl. Flora III **5**: 23. 1839 and HIPPOPERDON MONT., Ann. Sc. Nat. Bot. ii **17**: 121. 1842.

This proposal was recommended by the late Dr. S. M. Zeller, and is here first published. *Calvatia*, l.c., is monotypic, and there is therefore no question concerning the type of the genus. The synonyms to be rejected have been neglected by all students of the group since their publication and are not in current use; the proposal therefore would accomplish the object of conservation, "to avoid disadvantageous changes in the nomenclature of genera" (Art. 21). *Calvatia* is widely known, of some size (in number of species), and of considerable importance. It is here recommended that the proposal be adopted.

CIENKOWSKIA ROST. and CIENKOWSKYA REGEL & RACH and CIENKOWSKYA SCHWEINF. — Rehder et al. p. 408.

The conservation of Rostafinski's genus is not expressly proposed by Weatherby (l.c.), who merely points out that if the name is to be retained

it must be conserved against its homonyms. Since the genus has but one species, it is here recommended that *Cienkowskia* be not conserved.

CLADOCHAETE SACC. and CLADOCHAETA DC. — Rehder et al. p. 410.

In the discussion cited Weatherby points out the possibility that conservation of *Cladochaete* is necessary, but does not explicitly propose it. The question here is the same as that discussed in these notes under *Cyttaria* (q.v.) — whether or not the names actually are homonyms. Temporarily the position is here taken — on the grounds advanced with respect to *Cyttaria* — that they are not.

CLADODERRIS PERS. ex BERK. vs. CYMATODERMA JUNGH. — Donk 1941 pp. 156, 163.

As Donk states, if the name *Cladoderris* is to be retained conservation is necessary. The genus includes but few species (four distinct ones, according to Lloyd's account, in Myc. Writ. **4.** 1913) and is of no great importance in any respect; it is doubtful that conservation, which should be reserved for critical or important cases, ought to be invoked here, and rejection is recommended.

CLAVARIA VAILL. ex FR., Syst. Mycol. **1**: 465. 1821 — Type: *C. fragilis* Pers. ex Fr., l.c. p. 484 — vs. CLAVARIA STACKHOUSE, Ner. Brit. 2 ed. x. 1816. — Donk 1933 p. 74; Doty p. 126.

Donk suggested the possibility that because of Stackhouse's work (which he was unable to find) *Clavaria* might stand in need of conservation. There is a genus *Clavaria* Stackhouse, validly published in 1816, but never subsequently used, for a group of marine algae. Doty proposes the motion for conservation here cited. There is no obstacle to its adoption, and every reason, under Art. 21, why *Clavaria* Fr. should be conserved. Adoption is recommended.

COLLYBIA (FR.) QUÉL. vs. GYMNOPUS GRAY — Ainsworth & Bisby 1943 pp. 67, 128, 1945 pp. 73, 138; Singer & Smith 1946 pp. 249, 251.

Singer & Smith have so typified *Gymnopus* that it can either be considered a synonym of *Mycena* Pers. ex Gray or used for a possible segregate of that genus. If their lectotype be retained there is no need to conserve *Collybia* against Gray's name; it is recommended that the proposal not be adopted.

CONIOSPORIUM SACC. vs. CONIOSPORIUM LINK ex FR. — Mason 1933 pp. 15, 22; Ainsworth & Bisby 1943 p. 69, 1945 p. 75.

Mason states that the type specimen of the type species of Link's genus "has many-celled spores" and that "the genus . . . is accordingly not available for the large number of species with 1-celled spores, which have been compiled under *Coniosporium* in the Sylloge." Since there is no *Coniosporium* Sacc. (see discussion under *Acrothecium*) but only (in Michelia **2**: 21) the genus "Coniosporium Link," it is recommended that the proposal be rejected.

CONIOTHYRIUM CORDA vs. CLISOSPORIUM FR. — IR p. 124; IRA p. 39. CONIOTHYRIUM SACC. vs. CLISOSPORIUM FR. and CONIOTHYRIUM CORDA — BMS 2 p. 285.

First, of the proposal published in IR, it should be noted that the proposed lectotype was not published until long after Corda's death, was unknown to him, and consequently cannot have been the type of his genus; the type must be one of the four species originally included in it by Corda. As a representative of his genus Corda gave, in his Einleitung lxxxvii. 1842, the single species *C. Pini*; but "a[bgebildet] A[rt]" is not necessarily the same as "Grundform dieser Gattung," a phrase which Corda uses elsewhere, and probably there is no reason to select this species rather than one of the others as the type. In Michelia **2:** 7 Saccardo writes "*Conithyrium* Corda, Fuck."; but since Fuckel, in Symb. Mycol. 377, describes only his own species, apparently having seen none of Corda's, he cannot furnish the desired typification. In Syll. Fung. **3**: 305 Saccardo limits the genus to species with "sporae fuligineae," in so doing excluding all of Corda's original species except *C. Palmarum*, the only one to which Corda ascribed colored spores. Unless an earlier acceptable typification exists, Saccardo may then be considered to have designated *C. Palmarum* as the lectotype of *Coniothyrium* Corda.

There is, of course, no genus *Coniothyrium* Sacc. (see notes under *Acrothecium*). If the B.M.S. committee be followed in considering *Clisosporium lignorum* the type of *Clisosporium* Fr., and Saccardo in including *C. lignorum* in *Coniosporium*, Corda's genus, which is said to be widely employed, falls into synonymy with Fries's neglected name. There seems no obstacle to the conservation of *Coniothyrium*, and it is here recommended that it be conserved — but in the permissible form:

Coniothyrium Corda . . . — Type: *C. Palmarum* Corda — vs. *Clisosporium Fr.* . . .

CONOCYBE FAYOD vs. RADDETES KARST., PHOLIOTINA FAYOD, and PHOLIOTELLA SPEG. — Donk 1941 p. 156, 163; Singer & Smith 1946 p. 284.

On Donk's showing *Pholiotina* was effectually reduced to synonymy by Kühner, *Raddetes* would not at present be considered congeneric with the type of *Conocybe*, and *Pholiotella* has never been used since its publication. Singer & Smith state that the name *Conocybe* is valid. There is, nevertheless, as Donk points out, the real possibility that in the future someone, using a broader concept of the genus *Conocybe* than that now employed, would include with it species of *Raddetes* and would feel compelled to use the relatively unknown Karsten name. Since the mechanism of conservation is explicitly provided "to avoid disadvantageous changes in the nomenclature of genera," such a preclusive motion not only is in order, but is the most desirable sort of motion for conservation. It is recommended that the proposal be adopted. See notes under *Galera*.

CORDYCEPS FR. vs. CORDICEPS LINK — IR p. 121; IRA p. 39; BMS 3 p. 282.

As pointed out by the British committee, there is no "*Cordiceps* Link," his spelling being the same as Fries's; nor is there any conflict in application of the name, *C. militaris* being a principal element of the genus in both authors. The proposal should therefore be rejected.

It is not correct to state, however, as the committee has done, that "The generic name is *Cordyceps* (Fries [ut 'Trib.' sub *Sphaeria*, Syst. Mycol. II, ii, 323, 1823]) Link (1833)." It may well be that Link intended to elevate Fries's group to generic rank (he included most of its species); but in fact he nowhere cites Fries. The genus is therefore *Cordyceps* Link 1833. The only difference is in gender: *Cordyceps* Link is masculine, and *Cordyceps* (Fr.) Fr. (1849) feminine.

CORTICIUM FR. vs. PHLEBIA FR. and RICNOPHORA PERS. — Donk 1941 pp. 156, 164; Shear 1943.

CORTICIUM PERS. ex FR. vs. CORTICIUM PERS. ex GRAY — Ainsworth & Bisby 1943 p. 72, 1945 p. 79.

In connection with this proposal there is a subsidiary point which is of interest beyond the immediate case; this is a matter of selection of types, and arises out of the asserted synonymy of *Phlebia* and *Ricnophora*. Donk states that *P. radiata* Fr., which Fries designated (in 1828) as the genotype, is a *Ricnophora*, and that therefore the genera are obligate synonyms. Since Persoon stated on publishing *Ricnophora*, "Phlebia *radiata* . . . et . . . Phlebia *contorta* (quae tantum varietas videtur) verosimile huc pertinent" (Mycol. Eur. **2**: 8. 1825), the facts advanced may be taken as established. But the conclusion does not follow; for Persoon continues ". . . nec vero Phleb. *Merismoides* et *vaga*, quae ad auctoris genus reservari possunt," and follows this with a description of *Phlebia* Fr. and the two species which he retains in it.

To summarize this: (1) Fries published a genus with four species (1821). (2) Persoon, believing that genus to be heterogeneous, published a new genus (1825) to which two of the species (in his opinion) properly belonged, and explicitly reserved the remaining two species to Fries's genus. (3) Fries (1828) designated as the type one of the species which Persoon had excluded from Fries's genus.

Now according to "established custom," which "in the absence of a relevant rule . . . must be followed" (Art. 5), the first author to designate a lectotype, directly or by implication, has the right of choice, and must be followed unless there is a cogent reason for overruling his decision. In dividing the heterogeneous *Phlebia* into a part which should remain under that name and a part which should be removed Persoon was exercising a right of choice possessed by all and, unavoidably, exercised by most taxonomists. He "reserved" to *Phlebia* two of its four original species; and according to established custom one of them should be recognized as the type. Since *P. vaga* was later made the type of Karsten's genus *Phlebiella* (Hedw.

29: 271. 1890; cf. Mycologia **36**: 79. 1944), it would be logical and in accord with established custom to designate (provided no intervening decisions oppose) the other eligible species, *P. merismoides* Fr., as the type of *Phlebia* Fr.

Except that it involves a point of nomenclatorial practice which is important beyond the case under consideration, the typification of *Phlebia* is apparently of no consequence. Neither, probably, is the typification of *Corticium* Pers. 1794; but if it ever should be necessary to typify that pre-Friesian genus, it should be noted that *C. roseum*, which Shear regards as a "good species of *Corticium*" and which Donk regards as the type (although in a footnote he excludes it from "Corticium Fr." as "generically different"), is often treated as an *Aleurodiscus* (cf. Rogers & Jackson p. 299), and that *C. laeve* (cf. Rogers & Jackson p. 318) may be the one original species still retained in *Corticium*, and as such, as Shear points out, shoud be regarded as the type of Persoon's genus.

Finally, *Corticium* Fr. 1836 is a later homonym of *Corticium* Pers. ex Gray, Nat. Arr. **1**: 653. 1821. Under this name Gray listed only the single species *C. Quercinum* (Pers., Syn. Meth. Fung. 573, ex Fr., Syst. Mycol. **1**: 442, sub *Theleph.*), which must therefore be the type. Now *C. Quercinum* is generally considered a member of *Peniophora* Cooke; in fact, in justifying the erection of that genus Cooke gave his chief attention to *C. Quercinum* (Grev. **8**: 18. 1879), which should therefore be accepted as the genotype. *Peniophora* Cke. is consequently an obligate synonym of *Corticium* Pers. ex Gray; this conclusion is neither arbitrary nor mechanical, and would probably have been accepted by the author of the later genus if he had been acquainted with Gray's rather than Fries's treatment of *Corticium*.

In order "to reserve the name *Corticium* Fr. for that group of species which [is] at present held together under that name," Donk proposes to typify it by *Thelephora confluens* Fr. This, it appears, is contrary to Fries's own description. The whole characterization of *Corticium* as Fries first used it (Fl. Scan. 340. 1835) is "Hymenium ascigerum ceraceum, humectatum tumens, primitus setulosum, ascis perfectis = *Corticium*." If one amends the description by disregarding the "asci," he has left as Friesian generic characters "hymenium waxy, swelling when moistened, at first setulose." The texture described here might well be that of *Corticium confluens*; but that species is not setulose; any setulose species would by current workers be assigned to *Peniophora* (since the texture described is wrong for *Hymenochaete*). At the end of his key to the Auricularini (from which the foregoing description is extracted) Fries wrote "Cfr. Gen. Hymen." In Gen. Hym. 15. 1836 Fries (or Laurell, whose name appears on the title-page), gives a much longer description, which reads, in part, "Hymenium subdiscretum, ceraceum, udum molle tumens; siccum rigens . . . ; primitus laeve subsetulosum." Similarly in Epicrisis 556. 1838 Fries wrote "paraphysibus plerumque emersis setulosis pellucidis (nudo oculo vix conspicuis)." It would therefore appear that one who is to

typify *Corticium* Fr. as Fries conceived it is bound to select, either from the two species, *C. sulphureum* and *C. velutinum*, listed in Gen. Hym., or from the longer list in Epicr., a "setulose" species, and that *Corticium* Fr. is not merely a homonym but also a synonym of *Corticium* Pers. ex Gray and a synonym of *Peniophora*.

Like Donk (and presumably all other mycologists) Shear believes "that it is important to conserve as far as is practicable the present names of our well known and widely distributed genera," and accordingly proposes *C. laeve* as the type of *Corticium* Pers. Unlike Donk, Shear does not wish to work under the International Rules, which eliminate from consideration all names of Hymenomycetes published before 1821. Whatever may be said for or against the starting-point rule, it is certain that under the existing Rules mycologists are concerned not with *Corticium* Pers. 1794 but with *Corticium* Pers. ex Gray 1821 and *Corticium* Fr. 1835, 1836, and 1838. And it has here been shown that *Corticium* Pers. ex Gray and *Corticium* Fr. are earlier synonyms of *Peniophora* Cke. This is perhaps not so disadvantageous as would at first appear. For it has frequently been pointed out, most recently by Jackson, in Can. Jour. Res. C **26**: 129, 143–145. 1948, and Wakefield, Brit. Mycol. Soc. Trans. **30**: 155. 1948, that the phyletic relations are not within *Corticium*, *Peniophora*, and their kin, but across the generic lines at present accepted; that many members of *Corticium* are more closely related to members of *Peniophora* than to other corticiums; and that classification according to the indicated groups is certain to break up the genera now in use. As such revision is accomplished both of the generic names in question will lose the meanings they now carry, and their retention in new senses will prove confusing rather than enlightening. It is then perhaps as well that one of them — *Peniophora* — will ultimately have to be discarded on nomenclatorial grounds. Meanwhile, both names can be used as Donk uses *Poria*, allowing each to stand "ohne sichere systematische Stellung," as a "Sammelgenus" (Nederl. Mycol. Ver. Med. **23**: 217. 1933). Since both *Corticium* and *Peniophora* in the current sense are taxonomic monstrosities, no conservation can bring about the retention of either name in the current sense; it is recommended that the proposal be rejected.

CORTINARIUS FR. vs. CORTINARIA GRAY — Singer & Smith 1946 pp. 253, 255, 294.

Cortinaria was used by Persoon (Syn. Meth. Fung. 276) in 1801 for a section of *Agaricus*. In 1815 Fries adopted it as a "family" of *Agaricus* (Obs. Mycol. **1**: 6), and in 1821 as a "series" of *Agaricus* (Syst. Mycol. **1**: 10; p. 210 with reference to Persoon). In 1821 also Gray used the group as a genus (Nat. Arr. **1**: 627). In 1825 Fries changed the rank of his group from series to subgenus (Syst. Orb. Veg. 66) and spelled it *Cortinarius* (p. 69); in 1835 he briefly described the genus *Cortinarius* (Fl. Scan. 339) with a reference to his (? unpublished) Genera Hymenomycetum, and again in 1836 (Gen. Hymen. 7), without explicit reference

to any earlier treatment. His prefatory discussion, however, and especially the statement (Gen. Hymen. 5), "Ipse greges quasdam maxime recedentes a genere [*Agarico*] removi," imply that it was one of his earlier groups and would seem to justify the citation of *Cortinarius* as "(Pers. ex Fr.) Fr., Fl. Scan." But whatever the nomenclatorial relation between *Cortinarius* 1836 and *Agaricus* ser. *Cortinaria* 1821, it seems clear that they were published by Fries for essentially the same group; it is fully apparent that Fries at first used not only Persoon's name but his spelling, and that *Cortinarius* is merely an altered spelling of *Cortinaria*.

The proposal to conserve *Cortinarius* arises from the assumption that *Cortinarius* "is not a variant spelling according to the Rules," and that adoption of the valid *Cortinaria* (Pers.) ex Gray would necessitate a large number of transfers from *Cortinarius* (Pers. ex Fr.) Fr. The applicable Rule is Art. 70: "When the difference between two generic names lies in the termination, these names must be regarded as distinct, even though differing by one letter only. This does not apply to mere orthographic variants of the same name." It is submitted that *Agaricus* sect. *Cortinaria* Pers. ex Fr. and *Agaricus* subg. *Cortinarius* (Pers. ex Fr.) Fr. are "mere orthographic variants," and that *Cortinaria* (Pers.) ex Gray and *Cortinarius* (Pers. ex Fr.) Fr. are such in exactly the same degree; and that in consequence the first sentence quoted from Art. 70 "does not apply," because of the second. Since it is obvious that *Cortinaria* and *Cortinarius*, if used for the same genus, would produce "serious risk of confusion," they are orthographic variants not only from their history, but also by the provisions of Art. 70(3). Because of lack of citations for the "examples of different names" given under Art. 70, it might appear that the pair of "different" names *Peponia* and *Peponium* would contradict this conclusion. That example is elucidated in Kew Bul. Mis. Inf. **1940**: 83: the names declared different are not *Peponia* Naud. of the Cucurbitaceae and *Peponium* Engl. based on it, but *Peponia* Grev. of the Baccilariaceae and *Peponium* Engl. of the Cucurbitaceae. In conclusion, then, *Cortinaria* Gray and *Cortinarius* Fr. are not different names, and therefore no transfers are required to use the valid (Art. 70) earlier spelling. It is recommended that the proposal be rejected.

CYTTARIA BERK. vs. CYTTARIUM PETERM. — Rehder et al. p. 422.

The conservation of Berkeley's genus is recommended, l.c. The necessity for conservation, if *Cyttaria* is to be retained, arises out of Art. 70: "When the difference between two generic names lies in the termination, these names must be regarded as distinct, even though differing by one letter only. This does not apply to mere orthographic variants of the same name." The names in question are clearly "mere orthographic variants," and consequently cannot be "regarded as distinct" under Art. 70. According to the "examples of different names" listed under that Article, however, they are "different" — as different as *Monochaete* and *Monochaetum*, there cited. This curious contradiction between distinctness and difference will

be, it is hoped, clarified at the next Congress. The decisive clause at present appears to be that occurring in Note 3 under Art. 70: "the essential consideration is whether they may be confused with one another or not." This clause is here accepted as a guide (as by Rickett in Brittonia **6:** 365–6. 1948), rather than the questionable anonymous dictum in Kew Bul. Mis. Inf. **1940**: 83 that "generic names ending respectively in the masculine, feminine and neuter terminations *-us*, *-a*, *-um*, are held to be different." There seems in fact to be no danger of confusion of *Cyttaria* with the long-abandoned angiosperm genus *Cyttarium*; accordingly it is held that at present *Cyttaria* is valid without conservation. It is recommended that the proposal be tabled until some clarification of the Rules makes it again a useful proposal.

DALDINIA CES. & NOT. vs. HEMISPHAERIA KLOTZSCH, PERISPHAERIA ROUSS., and PERIPHEROSTOMA GRAY — IR p. 121, 127; IRA p. 39; BMS 3 p. 283.

As noted by the B.M.S. committee, Roussel's genus is pre-Friesian and therefore does not conflict with *Daldinia*, and *Cercidospora* is included in IR as a synonym of *Daldinia* only by error. The committee's statement that *Peripherostoma* 1821 is "invalid because pre-*Systema*" has been questioned (Mycologia **33**: 569. 1941). What the committee has written of the taxonomic character of *Perisp|h|aeria* and *Peripherostoma* — that they include a number of species of *Hypoxylon*, with *Daldinia concentrica* heading the list — is equally true of *Stromatosphaeria* Grev., Fl. Edin. lxxiii. 1824. Both *Peripherostoma* and *Stromatosphaeria* could be excluded from conflict with *Daldinia* by appropriate typification; or both could be excluded by being listed as nomina rejicienda. Since on the showing of the B.M.S. *Hemisphaeria* must conflict with *Daldinia*, and unless the latter is conserved must replace it, it is recommended that the motion to conserve *Daldinia* and reject *Hemisphaeria* be adopted. And since "a conserved name is conserved against all other names for the group, [etc.]" (Art. 21, Note 3), this action would prevent the displacement of *Daldinia* by *Peripherostoma* or *Stromatosphaeria* as long as *Daldinia* is retained in its current sense; it is therefore recommended that these other names not be listed as rejicienda, but be left available for other groups of fungi represented among their original species.

DICTYOLUS QUÉL. vs. LEPTOGLOSSUM KARST. — IR p. 123; IRA p. 39; Donk 1941 p. 185; Singer & Smith 1946 p. 291; Doty p. 130.

As Donk points out, there seems to be no considerable preponderance of usage in favor of the one or the other of these synonyms, and no compelling reason for making an exception in favor of the later name. It is recommended that Donk be followed and the proposal rejected. Singer & Smith suggest a third applicable name, *Leptotus* Karst.

EMPUSA COHN vs. EMPUSA LINDL. — Ainsworth & Bisby 1943 p. 99, 1945 p. 107; Fitzpatrick pp. 296, 297.

Empusa Cohn, Acad. Caes. Leop.-Carol. Nat. Cur. Nova Acta **25**: 317. 1855, is a later homonym of *Empusa* Lindl. 1824 of the Orchidaceae; it was based on the single species *E. Muscae* Cohn ("*Sporendonema muscae*? Fries Syst. mycol. III. p. 434"). Fresenius soon noted Lindley's homonym (Bot. Zeit. **14**: 883. 1856), as well as two homonyms among insect genera, and therefore wrote "Ich schlage deshalb . . . die Benennung 'Entomophthora' vor und subsumire nun darunter als Arten: 1. *Entomophthora Muscae* . . . *Empusa muscae Cohn* . . . . 2. *Entomophthora Grylli* . . . . 3. *Entomophthora sphaerosperma*." It is clear that *Entomophthora* Fres. was not published as a new genus, which could be used for a segregate from *Empusa*, but only as a new name for *Empusa* Cohn non Lindley et al.; it must therefore have the same type, *Emp. Muscae* Cohn. Since both names have been employed for the group, there appears no particular advantage in retaining the illegitimate name *Empusa*; this is especially true when it is noted that *Entomophthora* has furnished the name for both the family and the order in which the genus is included. It is therefore recommended that the proposal be rejected.

FLAMMULA (FR.) QUÉL. vs. RYSSOSPORA FAYOD, GYMNOPILUS KARST., and VISCULUS EARLE — IR p. 123; IRA p. 40; BMS 1 p. 227; Bisby p. 104; Singer & Smith 1946 pp. 263, 291.

FLAMMULA (FR.) QUÉL. vs. FLAMMULA (DC.) FOURR. — Donk 1941 p. 157, 166; Singer & Smith 1946 p. 263.

FLAMMULA (FR.) QUÉL. vs. GYMNOCYBE KARST. and FLAMMOPSIS FAY. — Singer & Smith 1946 p. 291.

With the exception of *Flammula* (DC.), all of the proposed nomina rejicienda were published later than *Flammula* (Fr.), which therefore need not be conserved against them. Donk and Singer & Smith (p. 263) question the desirability of the retention of *Flammula* for an agaric genus, but come to the conclusion that its conservation may as well be attempted. No recommendation is offered here except that Donk's proposal be adopted if conservation is decided upon; but it appears desirable to draw attention to the fact that not all species discussed in the various attempts to arrive at a typification of *Flammula* are eligible. Donk's discussion, and the second paragraph of p. 244 of Singer & Smith's paper, are pertinent here. It should be noted, however, that although Quélet declares his intention "to elevate to the rank of genera the subgenera of Fries," the subgenera of the Summ. Veg. Scand. are for the most part the tribes of the Syst. Mycol.; and that since tribes are susceptible of typification, when these are changed in rank the types of the tribes become the types of the subgenera or genera based on them. The type of the trib. *Flammula* Fr. must be chosen from among the species included in it in the Systema; that of the subg. *Flammula* (Fr.) Fr. and the gen. *Flammula* (Fr.) Quél. must be that same species. Donk points out, furthermore, that a type was designated for *Flammula*

by Earle (N. Y. Bot. Gard. Bul. **5:** 386) as long ago as 1909. This lectotype was not, however, *A. lubricus*, as Donk states, but *A. gummosus* Lasch, which Donk rightly stigmatizes and rejects as "a species not among Fries' original ones!" So much for acceptable procedure; the designation of a type, like the decision whether or not to conserve *Flammula*, is best left to agaricologists.

There is a minor problem of citation that may deserve comment here. In all of the places listed in the heading of this note *Flammula* is cited as published by Quélet in Champ. Jura Vosges p. 129. Quélet's great work was published in two forms: (a) Soc. Émul. Montbéliard Mém. ii **5:** [43]–332. pl. 1–23 + pl. 1 [= 24]. 1872; IIe partie [333]–427. pl. 1–5. 1873; IIIe partie [429]–556. pl. 1–4. 1875. (b) Champ. Jura Vosges. pp. [1]–320. pl. 1–23 + pl. 1 [= 24]. 1872; IIe partie [321]–424. pl. 1–5. 1873; IIIe partie [1]–28. pl. 1–4. 1875. Barbier, Montbéliard; and Baillière, Paris. Because of the irregular and awkward arrangement of the text in (b), it is here assumed, without conclusive evidence, that (a) was printed first. The length of the page in parts [i] and ii of (b) is less than in (a); for this the text was rearranged (without other alteration) to make about three lines less to the page in (b); therefore not only is the pagination changed, but the pagination of (a) cannot be calculated from that in (b). Part iii has altered pagination but the original page-length; the page in this part of (b) equals the page in (a) minus 428. Now the page (129) given for *Flammula* is the page where that genus appears in (a), the periodical, but the title cited is that of (b), the separate work. It is suggested that for future clarity Quélet's names be cited as published in Soc. Émul. Montbéliard Mém. ii **5:** (the preferred procedure for articles in periodicals) by those having access to that form of the work, and that whenever citation is made of Champ. Jura Vosges the page from the separate volume be given. *Flammula* is Soc. Émul. Montbéliard Mém. ii **5:** 129. 1872, or Champ. Jura Vosges 97. 1872.

GALERA (FR.) QUÉL. vs. CONOCYBE FAYOD — IR p. 124; IRA p. 40; BMS 1 p. 228; Singer & Smith 1946 pp. 264, 291.

GALERA (FR.) QUÉL. vs. GALERA BLUME — Donk 1941 p. 157, 168.

The report of the B.M.S. committee approves the IR proposal to conserve *Galera* for a fungus genus, with the type *G. tenera*. Donk gives what seem entirely cogent reasons for rejecting this typification, but likewise approves conservation. Singer & Smith "cannot see any advantage in maintaining the old generic name *Galera*, which is ambiguous"; they state that "the name *Galerula* Karsten is available to all who wish to use the genus in the concept of Quélet and Saccardo." Donk, on the other hand, treats *Galerula* as an autonomous segregate from *Galera*. The problem thus seems to be taxonomic rather than nomenclatorial, and as such should be left to the experts. If it appears that there is a generic group not segregated from *Galera* which stands in need of a name (as Donk implies) and if *Galera* 1825 of the Orchidaceae can properly be discarded by taxonomists

of vascular plants, Donk's proposal is desirable; otherwise, the procedure recommended by Singer & Smith, to let the homonymous *Galera* (Fr.) Quél. die a natural death, should be followed. See notes under *Conocybe*.

GOMPHUS PERS. vs. GOMPHORA FR. — Donk 1941 p. 157, 169.

This proposal was made solely because of uncertainty whether Persoon's *Mycologia europaea* Sect. 2 was published earlier or later in 1825 than Fries's *Syst. Orb. Veg.* Since *Mycol. Eur.* 2 is cited in *S.O.V.* — e.g., on p. 361 — Persoon's work must have been the earlier. Furthermore, *Gomphus* Gray, Nat. Arr. **1:** 638, 1821, also antedates Fries's variant name; and since the type of Gray's *Gomphus* (*G. clavatus* (Pers. Synops. sub *Merul.*) Gray) is the same fungus as that proposed by Donk as the lectotype of *Gomphus* Pers., the object of the proposal is achieved without special action. The proposal should be dropped.

GUEPINIA FR. vs. GYROCEPHALUS PERS. and PHLOGIOTIS QUÉL. — IR pp. 122, 123; IRA pp. 40, 41; Martin 1936, 1948 p. 116; Donk 1941 p. 185, 193.

GUEPINIA FR. 1828 vs. GUEPINIA BAST. 1812 and GUEPINIA FR. 1825. — Martin 1936.

As Donk notes (p. 193), it would appear that *Phlogiotis*, which in IR appears as a nomen rejiciendum opposite *Pilacre*, was intended rather as an alternative to *Guepinia*. In IR the two appear in successive lines; in IRA, because of alphabetizing, more than a page apart. As pointed out by both Martin and Donk, *Gyrocephalus* Pers., in spite of the authority given to its use by Brefeld, has nothing to do with *Guepinia*.

Guepinia was published in 1825, for *Tremella Helvelloides* DC. That fungus is also the type of *Phlogiotis* Quél. 1886; and, since *Guepinia* Fr. is a later homonym, Martin uses Quélet's generic name for it. If one is wiling to stretch a point in accepting as valid a rather sketchy form of publication (as one must often do for earlier authors), *Tremiscus* (Pers. Mycol. Eur. **1:** 103. 1822 ut subg.) Lév., Consid. Mycol. 108. 1846; d'Orbigny Dict. Univ. Hist. Nat. **8:** 487. 1847,* is a second name to be considered here. Persoon's subgenus included two species, *Tremella fimbriata* and *Tremella rufa*; in order to avoid complications, *T. fimbriata* is hereby designated as the lectotype of that subgenus.

In 1828 Fries added to *Guepinia* a second species, *G. Spathularia*

* Léveillé, J. H. Considerations mycologiques suivies d'une nouvelle classification des champignons. Extrait du Dictionnaire universelle d'histoire naturelle. pp. 136. Paris, Impr. L. Martinet, 1846 — A separate printing, with the text apparently identical, but in single columns, and with different paging, of Léveillé's article "Mycologie" in the *Dict. Univ.* A number of subgenera of other authors are listed as genera — without, or with a minimum of, the apparatus of citation demanded by Art. 37. For *Tremiscus* one finds only:

Section VII. — Trémellés
[Short diagnosis for section]
Genres: . . . *Tremiscus*, Pers.

(Schw.); and in 1838 a third, *G.* ? *Cyphella* (*Cyphella Friesii* Weinm.); that fungus is a member of the genus *Guepiniopsis* Pat. 1883 (q.v.). In the course of thirteen years, then, Fries assigned to *Guepinia* three fungi, now held to be members of three genera in two different families. The name *Guepinia* is a homonym invalid for fungi under the Rules but is not actually employed elsewhere. Since the type, *G. Helvelloides*, has a good name (*Phlogiotis*), Martin and Donk imply that the proposal printed in the Rules may well be rejected; and a third vote for their recommendation is here recorded. Martin proposed that, since for *G. Spathularia* there was no other generic name available, the name *Guepinia* be conserved with that species as the type. It is here submitted that there is no *Guepinia* Fr. 1828. The Nomenclature Committee of the B.M.S. has well written, in another connection, "Since the adoption of the type-species method of fixing the application of generic names, [the] proposal appears unacceptable. The monotypic *Carlia* Rabenh. cannot become another genus as the result of the addition by Bonorden of two further species." (BMS 1 p. 219.) The fact that here Fries himself, rather than another author, added the "further species" does not alter the case. This is in agreement with the final decision of Dr. Martin, who has proposed a new genus *Dacryopinax* to include *G. Spathularia*. It is recommended that the second proposal also be rejected.

GUEPINIOPSIS PAT. vs. GUEPINIA FR. 1830 — IR p. 123; IRA p. 40; Martin 1936; Donk 1941 p. 186.

As noted by Donk, "Fr. Elench. (1830)" is the same as Fr. 1828; the author of this proposal happens merely to have had in his possession one of the copies of the *Elenchus* bearing the later title-page (Ramsbottom, Brit. Mycol. Soc. Trans. **18:** 316. 1934). The present proposal is to conserve *Guepiniopsis* as typified by a fungus not originally included in that genus (but belonging to a different genus) against *Guepinia* as typified by a fungus not originally included in that genus (but belonging to a different family; see notes under *Guepinia*.) "Guepinia Fr. Elench." is a nonentity, and *Guepiniopsis* stands without conservation — for its type species (cf. Martin and Donk). The proposal should be rejected.

GUIGNARDIA VIALA & RAVEZ VS. CARLIA BON. NEC RABENH. — IR p. 121; IRA p. 40; BMS 1 p. 218.

On the showing of the B.M.S. committee there is no *Carlia* Bon., and *Carlia* Rabenh. is not the same as *Guignardia*; conservation is therefore unnecessary and, as proposed, impossible. The proposal should be rejected.

GYMNOSPORANGIUM HEDW. F. EX LAM. & DC. VS. PUCCININA [MICH.] ADANS., AECIDIUM PERS. IN GMEL., AND ROESTELIA REB. — IR pp. 126–7; IRA p. 40.

Under the Rules all three proposed nomina rejicienda are already rejected — *Puccinina* Adans. 1763 under Art. 20(e) as antedating Persoon's *Synopsis*, the starting-point of nomenclature for rusts, and *Aecidium* and

Roestelia under Art. 57, as applying to imperfect states (cf. Rogers 1948). The proposal should be rejected, and revived for consideration only if Art. 20 or Art. 57 is so modified as to alter the status of *Gymnosporangium*.

HENDERSONIA SACC. vs. SPOROCADUS CORDA — IR p. 125; IRA p. 40; BMS 2 p. 291.

There is no such genus as *Hendersonia* Sacc. (see notes under *Acrothecium* and *Stagonospora*). On the showing of the B.M.S. committee the type species of *Hendersonia* Berk. is not congeneric with any of Corda's species of *Sporocadus*. The proposal should be rejected.

HERICIUM PERS. vs. HERICIUM FR. — Donk 1941 pp. 157, 169.

Like Donk's proposal concerning *Gomphus* vs. *Gomphora*, this arises out of uncertainty whether *Myc. Eur.* 2 was published before or after *S.O.V.* Like *Gomphus* (q.v.), *Hericium* Pers., proposed for conservation, is valid without conservation (1) because (l.c.) it antedates the proposed nomen rejiciendum, and (2) because, as *Hericium* Pers. ex Gray, Nat. Arr. **1:** 652. 1821 (having the same type as the one proposed), it long antedates both 1825 publications. The proposal should be dropped.

HEXAGONA FR. vs. SCENIDIUM (KLOTZSCH) OK. — IR p. 123; IRA p. 40; BMS 3 p. 288; Donk 1941 p. 187.

The accounts of the history of *Hexagona* given in BMS and by Donk (l.c., and 1933 p. 129) differ in a number of points; and it appears that a fresh recapitulation is in order. Since *Hexagona* and *Favolus* have all along been confused (and in fact interchanged by Fries) the history must include both names. *Favolus* Palis. was published in 1804 for *F. hirtus*; later Palisot added *F. glaber* and *F. tenuiculus*; those publications are of course pre-Friesian and invalid. Fries published "*Favolus* Pal." as a subdivision (presumably subgenus) under *Polyporus*, in Syst. Mycol. **1:** 342. 1821; in it he included twelve species, including two of Palisot's. It is submitted that since he cited Palisot as the author of the name, the type of the subgenus should be chosen from those Palisot species which Fries included in it — i.e., *P. tenuiculus* (Palis.) ex Fr. and *P. hirtus* (Palis.) ex Fr. In S.O.V. 76. 1825 Fries stated that in discussing *Favolus* for the *Systema* he had seen no specimens, and had subjoined it to *Polyporus*, from which he later knew it to be quite diverse; he then gave a list, headed "sequentes videntur genuinae species." The list includes eight names, of which only four were included in the subgenus; two of the four are *F. tenuiculus* and *F. hirtus*, and since they and the genus are still attributed to "P B" — i.e., Palisot de Beauvais — it is evident that the genus is not new, but the former subgenus elevated in rank, and that no change in typification is admissible. In Elenchus **1:** 44. 1828 Fries again discussed *Favolus*, repeating much of what he had said in S.O.V., and writing also ". . . nomen genericum supervacaneum hoc loco servo. . . . Unicam modo speciem vidi [*F. brasiliensis* (Fr.) Fr. = *Daedalea brasiliensis* Fr., S.M. **1:** 332 = *Merulius daedaleus* Lk.]." Since Fries here referred the name to

S.O.V., and by using it refuted his assertion that it was "superfluous," this passage can, it would seem, have no effect on the standing of *Favolus*.

Hexagona was published in Fl. Scan. 339. 1835, in a key to the Polyporei providing ample characters for a description. A part of that key reads as follows: "3) alveolares, hexagoni, jam primitus ampli a) suberosi, ascis imperfectis = *Hexagona*, b) lenti, ascis perfectis didymosporis = *Favolus*." When Fries next discussed *Hexagona*, in Epicr. 496–498. 1838, he wrote, "Hoc et sq. genus [Favolum] sub Favolo comprehendit *Palisot*." Of the species that both Palisot and he had comprehended in *Favolus* one remains a part of that genus in the *Epicrisis*, *F. tenuiculus* Palis.; the other becomes *Hexagona hirta*. Thereby Fries himself established the typification of *Favolus*, by *F. tenuiculus*, in so doing following the indications of his key: for *H. hirta*, which should be "suberos[a]," is characterized by "pileo suberoso" in S.M., and *F. tenuiculus*, which should be "lent[us]," has a pileus merely "coriaceo" in S.M. and "*submembranaceo*" in Epicr.

The type of *Hexagona* is not so easily determined. In his discussion of the proposals for conservation Donk writes "[The type of *Hexagona*] should be *Favolus hirtus* Beauv. . . . and not *H. apiaria* (Pers.) Fr. The latter species was incorporated by Fries later on (Ep. 497. 1838). It was not among Fries' original species!" Donk's citation of p. 129 of his 1933 paper does not make this statement more comprehensible. Donk agrees that *Hexagona* was published by Fries in Fl. Scan., where no species are listed, and that his next treatment is in *Epicr.*, where twelve species are described in the genus. How then could one of these twelve have been "incorporated by Fries later on," or be "among Fries' original species" less than any other? Normally, since *Hexagona* is attributed in *Epicr.* (but not in the earlier *Fl. Scan.*) to Pollini, one would seek for the lectotype a Pollini species — in this case, *H. Mori*. But of that species Fries wrote, "Haec, sola Europaea, mihi ignota est," whereas some of the others he himself had described. There would seem to be little obligation to recognize *H. Mori* as the type, especially since the genus should be written *Hexagona* Fr. 1835. Any species treated as a *Hexagona* in the *Epicrisis* which agrees with Fries's original description (as *H. Mori* does not) can be designated as lectotype, and the B.M.S. committee, Clements & Shear (who suggest *H. crinigera*) or Donk may equally well be followed.

As to conservation: It is obvious from the proposal that that is unnecessary. Another vote is here added to those of Donk and the B.M.S. committee for rejecting the motion.

HIRNEOLA FR. 1849 VS. HIRNEOLA FR. 1825 and LASCHIA FR. — Donk 1941 p. 157, 170.

The proposal is based on the assumption that there are two distinct and independent genera *Hirneola* Fr. *Hirneola* was published by Fries in S.O.V. 93. 1825; by reference to Syst. Mycol. **2:** 161. 1822 it was erected for *Peziza flava* Sw. ex Fr. In 1849 Fries published an extended description

of "Hirneola. *Fr. Syst. Orb. Veg. p.* 256." (K. Vet. Ak. Handl. **1848:** 144.), and descriptions of sixteen species. Since he not only omits all mention of *P. flava*, even under the heading "Reliquae hujus [generis] species sunt: . . .", but designates another type, he clearly implies that he no longer considers it a part of the genus. This would seem to be a case of "exclusion of the type" (see remarks under *Phoma*). If it is such, there can be only one result, that prescribed by Art. 18: "The name of a group must be changed if the type of that name is excluded." There is nothing in the Rules to justify citing *Hirneola* Fries 1849 as a different name from *Hirneola* Fr. 1825.

The name *Hirneola* as Fries used it in 1849 and as it has subsequently been used by various mycologists is applied to fungi like *Auricularia* except that "the hymenial layer is superior" (Fr. 1849 p. 144). As Martin (1943 p. 80) and others have pointed out, and as anyone situated where auriculariaes occur can confirm, this upside-down auriculariaceous genus is a myth. Whatever is to be said of the designated, but inacceptable, type *Peziza nigricans* Sw. (reported by its author to occur "on the ground"), the lignicolous *Hirneola nigra* ("Swarz") Fr. has an inferior hymenium, in this not differing from *Auricularia*. *Laschia* is similarly not properly distinguishable from *Auricularia*. Since *Hirneola* 1849 is therefore a nomenclatorial nonentity, and any renaming of Fries's 1849 concept would be taxonomically superfluous, there is neither need nor possibility for conservation. The proposal should therefore be rejected.

HYDNUM FR. vs. DENTINUM GRAY — Donk 1933 pp. 13–15.

There is no question whatever, in the mind of the author of this proposal or of anyone else, that if *Hydnum* and *Dentinum* are synonymous (as implied by the proposal) *Hydnum* will stand. There is therefore no occasion, under Art. 21, for the proposal, and it is here recommended that it be rejected.

This legalistic position is taken not out of perversity but on principle. The proposal in question, like a number of others, is a disguised attempt to gain the approval of a commision or the Congress for a particular typification. Banker (Torrey Bot. Club Mem. **12:** 104. 1906), working under the American Code, typified *Hydnum* L. by *H. repandum*, making *Dentinum* an obligate synonym. Miller (Mycologia **25:** 298–299. 1933), working under the International Rules, typified *Hydnum* L. ex Fr. emend. Gray by *H. imbricatum*, making *Sarcodon* Karst. a synonym. Now Gray must be considered the first post-Friesian author to restrict the originally inclusive genus *Hydnum*, and as such his decision is cogent if not irrevocable. Donk, l.c., treating Gray's work as pre-Friesian, typified *Hydnum* as did Banker. Since it has been shown (Mycologia **33:** 568–570. 1941) that Gray is post-Friesian, it may be that Donk would no longer support the proposal under discussion. It is a fact that he has not repeated it in his more recent (1941) more exhaustive consideration of nomina conservanda. What is of greater importance to the present discussion, how-

ever, is that for a considerable number of mycologists *Hydnum* Fr. and *Dentinum* Gray are not synonymous, that by the normal operation of the Rules they do not become synonymous, and that only by a special act of the Congress (the proposal under discussion) establishing a type species in opposition to "established custom" (which must recognize Gray's emendation) is there touched off a conflict between these names.

Since the past Congresses have deferred the adoption of a text for Appendix I, "Regulations for determining types," there are at present no rules for deciding in which sense *Hydnum* is to be held. There is, of course, "established custom," and in this case it is probably sufficient. But conservation is supposed to result in "a list of names which are to be retained as exceptions." Where there is no rule there can be no exception. It is absurd for a committee or a Congress to vote to make an exception of *Hydnum* when no one can say authoritatively what *Hydnum* is. It is absurd for two reasons: (1) Questions like this of the typification of *Hydnum* should be settled by consultation of experts — like Donk and Miller — and not by majority vote of the inevitably uninformed. (How many votes at the next Congress will be allotted to students of the Hydnaceae?) (2) The rules — i.e., Appendix I — should first be adopted, and afterward, if necessary, the exceptions.

HYMENOCHAETE LÉV. vs. STEREUM FR. and HYMENOCHAETA BEAUV. — Donk 1941 pp. 157, 171.

This proposal is offered on the supposition that "Fries (. . . 1825) was the first to publish validly the name *Stereum* as a generic one . . .". Actually, as shown later in these notes, under *Stereum*, *Stereum* Pers. ex Gray 1821 antedates Fries's use of it as a generic name. And since the 1821 genus can be typified by *S. hirsutum*, Gray's publication preserves the name in its present sense. Whatever can be said of *Stereum* Fr. 1825, it is at most a later homonym of *Stereum* Pers. ex Gray, and cannot interfere with the retention of *Hymenochaete* Lév.

The author notes that *Hymenochaeta* Beauv. is probably not to be regarded as a homonym of *Hymenochaete* Lév., but that previous to the publication of the latter name Nees used, for the former, the incorrect spelling *Hymenochaete*. He regards this as intentional, and as valid publication. He would then conserve *Hymenochaete* Lév. 1846 against *Hymenochaete* Beauv. ex Nees 1834. In the absence of evidence to the contrary, it seems less troublesome to consider *"Hymenochaete"* in Nees an erroneous printing of *Hymenochaeta* Beauv. — to whom Nees attributes the name. In that event, no conservation is necessary; the proposal should be rejected.

HYMENOGRAMME BERK. & MONT. vs. ASCHERSONIA ENDL., JUNGHUHNIA CORDA, and LASCHIA JUNGH. — IR p. 123; IRA p. 40; Donk 1941 p. 188.

Donk points out that there is no good reason to suppose *Hymenogramme* synonymous with the proposed nomina rejicienda, and that the genus is in

any case not of sufficient consequence to be worthy of conservation. He implies that the proposal should be rejected; and that action is recommended here also.

HYMENULA FR. vs. HYMENELLA FR. — IR p. 126; IRA p. 40.

According to Fries's own reference (Elench **2:** 37. 1828) *Hymenula* is merely an altered spelling of *Hymenella*. If it were a different genus it would be, l.c., a nomen nudum, since no generic diagnosis is given. It seems pointless to conserve a name in order to retain a particular spelling. Conservation can have no other effect, since *Hymenula*, being a mere renaming of *Hymenella*, must have the same type as that genus. The normal procedure would be to designate *H. vulgaris* Fr. as the type; the proposed lectotype, *H. rubella*, not one of the original species of *Hymenella*, is not elegible. The proposal should be rejected.

HYPOCHNUS FR. vs. LYOMYCES KARST. — IR p. 123; IRA p. 40; Rogers 1939; BMS 1 pp. 224, 232; Donk 1941 p. 188.

The numerous inaccuracies in the proposal are discussed in the various places here listed. Briefly, it seems to be agreed that *Hypochnus* Fr., Syst. Mycol. **3:** 289, is a genus of lichens; that there are so many conflicting "interpretations" of that name that *Hypochnus* is a nomen ambiguum; and that the proposal should be rejected. See notes under *Tomentella*.

HYPOLYSSUS BERK. vs. PERONA FR. and CARIPIA OK. — Martin 1938 p. 440, 1948 p. 113; Donk 1941 p. 195; Ainsworth & Bisby 1943 pp. 144, 217, 1945 pp. 155, 232; Doty pp. 126, 133.

Martin does not explicitly propose conservation of the name *Hypolyssus*, but writes (l.c.) "a good case could be made for the conservation of *Hypolyssus* in Berkeley's sense." It appears of some interest to examine that case here.

Hypolyssus was originally published by Persoon for two species which in all probability were agarics parasitized and distorted by *Hypomyces* (for reference see under nomina confusa). The generic and specific names which he used are then without much doubt nomina confusa, automatically rejected under Art. 64. (See under *Hypomyces*). *Hypolyssus* appears never again to have been used for the fungi on which Persoon based it. Berkeley (Lond. Jour. Bot. **1:** 139–140. 1842), after a description of a wholly different fungus, wrote "As Persoon's genus *Hypolyssus* is altogether effete, and its characters are very like those of the plant before us, I have thought it advisable to restore it"; in consequence he described *Hypolyssus Montagnei* under *"Hypolyssus, Pers."*

Since Berkeley explicitly was using "Persoon's genus" the only justification for citing a genus *Hypolyssus* Berk. would have to arise out of Art. 47, which, as modified at Amsterdam (see citations and discussion under *Phoma*), may be interpreted as permitting such citation if 1) the diagnostic characters or circumscription are altered and 2) the type is excluded. It is

submitted that although Berkeley gave an essentially new description of *Hypolyssus*, he did not alter its diagnostic characters, since he wrote, "Its characters are very like those of the plant before us," and that he did not alter its circumscription except to enlarge it as anyone enlarges a genus who adds a new species to it. It is submitted also that he did not exclude the type; in fact, he did not directly or by implication so much as mention the species already belonging to the genus. He "restored" the name of a genus "altogether effete" — much as was done with *Patouillardina* in Mycologia **28:** 398. 1936, and with the species *Chrytridium Saprolegniae* (see discussion under *Olpidiopsis*). Since there was neither alteration of diagnostic characters nor exclusion of type, there is no *Hypolyssus* but *Hypolyssus* Pers., a nomen confusum.

There are two names which appear to have been validly published for the genus exemplified by Berkeley's fungus, *Podostrombium* G. Kunze ex Lév., Considerations Mycologiques p. 119. 1846 ("Extrait de" d'Orbigny, Dict. Univ. d'Hist. Nat. **8:** 491. 1847), and *Caripia* OK., Rev. Gen. Pl. **3**(2): 451. 1898. The whole reference to *Podostrombium*, l.c., is as follows: "*Podostrombium*, Kz. = *Hypolyssus Montagnei*, Berk." This clearly does not include more than a minimum of what is requisite for valid publication; but it seems not unreasonable to read it as 1) a new name, *Podostrombium*, 2) substituted for *Hypolyssus* as described by Berkeley [the description having been effectively published] 3) for *H. Montagnei*. The name *Podostrombium* G. Kunze had been in the literature long before 1846, but seems not to have been previously published. Since both *Podostrombium* and *Caripia* were explicitly substitutes for *Hypolyssus* sensu Berk. non Pers., there is no doubt of the synonymy. Two other names sometimes cited as synonyms have less claim to that status. One is *Heringia* Schw. in sched. ex B. & C., Acad. Nat. Sci. Phila. Jour. ii **2:** 279. [1853] & **3:** 205. 1856 (pro synon.), nec *Heringia* Agardh; since it was published only in synonymy, it is obviously a nomen nudum. The other is "*Perona* Fr." which similarly is a nonentity. .Fries wrote (Summ. Veg. Scand. 333. 1849) "Perona *Berkl. in Hook. Lond. Journ. 1 p. 39.* Pileus suberosus, hymenio laevissimo rimoso."; and in his index, p. 568, "Hypolyssus B. (Perona)." But it is only by a set of curious circumstances that the name *Perona* ever came to be used in this connection. For it is not a Berkeleyan genus, nor a Friesian, but a Persoonian, published in Mycol. Eur. **2:** 3. 1825. Fries seems to have had a general idea that Berkeley had revived one of the small genera from Persoon's Mycol. Eur., but to have picked out the wrong name, cited the wrong page for Berkeley's publication, missed the diagnosis given by Berkeley (Fries wrote "quatenus hoc genus sine caractere generico l. c. propositum . . ."), and finally tried to make amends in the index to the Summ. Veg. Scand. In any case, it is not *Perona* Fr. (as cited by Saccardo, Syll. **6:** 521. 1888), but "*Perona* Pers. erroneously ascribed to Berkeley by Fries."

That leaves, then, the matter of conservation of *Hypolyssus* Berk. Donk's remark is to be heartily approved: "It seems not necessary to

propose *Hypolyssus* 'Berk.' as a nomen conservandum, since there is a good other generic name available [Donk lists both] and also because the genus includes only 1 or at most 2 species!" Dr. Martin writes that *Podostrombium* is acceptable to him.

HYPOMYCES TUL. vs. HYPOLYSSUS PERS. — IR p. 121; IRA p. 40; Bisby p. 102.

As pointed out by the eminent O. Kuntze (Rev. Gen. Pl. **3**(2): 487. 1898), by Martin (1938, p. 440), and probably by others, *Hypolyssus* Pers. (q.v.) was based on specimens of Agaricaceae overgrown and distorted by *Hypocrea* or *Hypomyces*. On these grounds Kuntze sought to use the name *Hypolyssus* for *Hypomyces*. But under the Rules the name *Hypolyssus* Pers. must be rejected as a nomen confusum (Art. 64). In consequence it cannot interfere with the use of *Hypomyces* Tul. and the proposal is unnecessary. It should be rejected.

HYPOSPILA (FR.) FR. vs. PHOMA FR. — IR p. 121; IRA p. 40; BMS 3 p. 284.

This, one of the most extraordinary proposals (at least in reference to fungi) to come before the Congress, is summarized well, if mildly, by the B.M.S. committee. What, if anything, was supposed to be the meaning of the citation "*Hypospila* Fr. [Syst. Orb. veg. (1825?) 109], Summ. Veg. Scan. (1849) 421" remains a mystery; *Hypospila* is published in both places as a genus. In addition, in both places Fries designated the type of his genus: "*Typus est Spiloma inustum* Ach.," and "Typus *Sph. inusta* El." [**2:** 88. 1828, based on *Spiloma inustum* Ach.] If *S. inustum* is a nomen dubium, as Petrak & Sydow declare (Ann. Mycol. **21:** 369–371. 1923), the only possible consequence is that the name *Hypospila* is also a nomen dubium, to be rejected under the Rules as by Petrak & Sydow. It is therefore all the more surprising that the proposal is made to recognize as the type of *Hypospila* the species *Phoma pustula* Pers. sub *Sphaeria* ex Fr., Syst. Mycol. **2:** 547. 1823, the designated type of *Phoma* Fr., Novit. Fl. Suec. 80. 1819, and a species which Fries never acknowledged as a *Hypospila*. It is as though one were to propose *Agaricus campestris* as the type of *Hypospila* and as a consequence the conservation of *Hypospila* vs. *Agaricus*. The B.M.S. committee has recommended the rejection of the proposal, and that recommendation is here seconded. See later notes under *Phoma*, and on *Hypospila* among nomina confusa.

LACHNOCLADIUM LÉV. vs. ERIOCLADUS LÉV. — Donk 1941 pp. 157, 173; Doty p. 130.

Donk infers that Léveillé, following a homonym rule of his day, substituted *Lachnocladium* for his *Eriocladus*, and was followed in this by all mycologists. Since his homonym rule is not ours, *Eriocladus* is again valid, unless made a nomen rejiciendum by formal conservation of the synonym.

Dr. M. S. Doty notes (in a personal communication, more recently published by him) that with the exclusion of species not congeneric with the

type of *Lachnocladium* (and *Eriocladus*) and the necessary reduction of nearly all others to synonymy with the type, the genus becomes very small, probably too small to justify the conservation of the name. Furthermore, for the genus in such a restricted sense the name *Lachnocladium*, generally understood in a much broader sense, is actually a source of confusion. It is therefore here recommended that *Lachnocladium* not be conserved, and that the valid *Eriocladus* be allowed to stand.

MACOWANITES KALCHBR. vs. MACOWANIA KALCHBR. APUD BERK. and HYPOCHANUM KALCHBR. — Ramsbottom 1942.

Of the synonyms listed *Macowania* must in any case be rejected as a later homonym. On Ramsbottom's showing *Hypochanum* was the earlier published of the remaining names and is valid. Zeller & Dodge (Mo. Bot. Gard. Ann. **23:** 636–638) recognize only two species in the genus, which is not otherwise important. On the principle of refraining from interference with the operation of the Rules except in important cases, it would be well in such a minor case as this to reject the proposal. Dr. S. M. Zeller reports (in Mycologia **40:** 643. 1948) his rejection of *Macowanites* (= *Hypochanum*) as an autonomous group; *M. agaricinus*, the genotype, is "an aberrant agaric belonging perhaps to *Russula*."

MARASMIUS FR. vs. MICROMPHALE GRAY — Singer & Smith 1946 pp. 252, 255, 295.

The proposal is for what the authors (p. 294) call conditional conservation — i.e., if an author holds the two genera to be synonymous, *Marasmius* is to be retained; if he considers that *Micromphale* constitutes a genus distinct from *Marasmius*, both names are to be available. Except for names which are obligate synonyms — i.e., have the same type — that seems to be the nature of all conservation. For conservation is provided "to avoid disadvantageous changes in the nomenclature of genera," and the conserved names are "retained as exceptions" (Art. 21). Where there would be no disadvantageous changes — as where *Marasmius* and *Micromphale* are held to be the names of taxonomically distinct genera — any conservation is automatically inapplicable; or, to put the same thing another way, where the name *Marasmius* would not be retained as an exception — as, again, where there are held to be two distinct genera — conservation is inoperative. The Rule for conservation (like many others) is essentially a footnote to Art. 16: "Each group with a given circumscription, position and rank can bear only one valid name"; conservation provides exceptions in the manner of deciding upon that one name. But where there are more groups than one, there can and must be more names. In these notes it has occasionally been recommended, as under *Plowrightia*, that a motion for conservation be rejected on the grounds that the names are not synonymous. Such recommendations are made not on the supposition that conservation would in such a case alter the status of either name in the least, but only to avoid useless expansion of the list of nomina conservanda, and the confusion resulting from the incorrect implication that the names in-

volved are synonymous. On the other hand, the proposal to conserve *Tomentella* vs. *Caldesiella* (q.v.) was just such a conditional proposal as that for conserving *Marasmius*, and has been accepted by the B.M.S. committee and by Donk as well as by its author. It is recommended that the present proposal be adopted.

MARSSONINA MAGN. vs. MARSONIA SACC. and MARSSONIA FISCH. NON KARST. — IR p. 125; IRA p. 40; BMS 2 p. 291.

Since *Marssonia* Fisch. is a hyponym it need not be conserved against; furthermore, as the name originally appeared in Rabenh. Fung. Eur. it was (according to Magnus, Hedw. **45:** 88. 1906) a nomen nudum, and apparently was first validly published ex Allesch. in Rabenh. Krypt.-Fl. 2 Aufl. **1** (**7**): 595. 1902. Since Saccardo had already published the name (with altered spelling) in 1880, attributing it to Fischer, *Marssonia* Fisch. is not only a hyponym but a later orthographic variant of *Marsonia* Fisch. ex Sacc. It seems clear that *Marsonia* is, under Art. 70, last paragraph of "Examples," a "mere orthographic variant" of *Marssonia*, and therefore, like that spelling, a hyponym of Karsten's name. *Marssonina* therefore stands without conservation. The proposal should be rejected.

MASSARIA NOT. vs. SPLANCHNONEMA CORDA — IR p. 121; IRA p. 40; BMS 3 p. 285.

The typification recommended by the British committee is "*M. inquinans* de Not. nec *Sphaeria inquinans* Tode ex Fr." Since *M. inquinans* Not. is based on *S. inquinans* Tode ex Fr., this proposal is contrary to Art. 54 as amended at Amsterdam (Zesde Int. Bot. Congr. Proc. **1:** 347, 354. 1936; Science **83:** 417, 1936; omitted in IRB p. 85 and IRA p. 20): "When on transference to another genus, the specific epithet has been applied erroneously in its new position to a different plant, the new combination must be retained for the plant on which the epithet was originally based and must be attributed to the author who first published it." Therefore, whatever de Notaris had in hand, the monotypic genus *Massaria* was based on *M. inquinans* (Tode ex Fr.) Not.; there is no other *Massaria inquinans*.

On the showing of the British committee it is far from certain that *Splanchnonema* is synonymous with *Massaria*. In view of the uncertainty concerning their identity, it seems not proper to conserve the one genus against the other. The proposal should be rejected.

MASTOMYCES MONT. vs. TOPOSPORA FR. — IR p. 125; IRA p. 41; BMS 2 p. 289.

The case for conservation of *Mastomyces* presented in BMS appears entirely acceptable except that only two species belong to either genus. Since the genus is small and of no particular importance (especially since one of these specific names, "of only temporary value" — Art. 57, par. 2 —, must give way to the name *Godronia urceolus*), it is recommended that the proposal be rejected, along with those listed on a later page under *Tremellodon*.

MELAMPSORA CAST. vs. UREDO PERS. — IR p. 126, 127; IRA p. 41; Rogers 1948.

Since *Uredo* is already rejected by Art. 57, and by the examples thereunder, as a name applied to an imperfect state (cf. Rogers), the proposal is unnecessary and should be rejected.

MELANOGASTER CORDA vs. UPERHIZA BOSC, HYPERRHIZA SPRENG., ARGYLIUM WALLR., OCTAVIANIA VITT., and UPERRHIZA FR. — IR p. 124; IRA p. 41; Zeller & Dodge p. 640; Cunningham p. 47.

Melanogaster was published in a place not easy to cite: Sturm, Deutschl. Flora III Abt. 3 Bändchen. 11 Heft: 1. 1831. The title page for the "Bändchen" bears the year 1837; the several included "Hefte" were, however, published at different dates, each with its own colored-paper cover; and that for 11 Heft is dated 1831. The citation here given (which differs from those printed in the Rules and in Zeller and Dodge) and the date 1831 (six years earlier than that given for the genus in the Rules) should be used.

Zeller & Dodge state that *Uperhiza* Bosc. (and the variant names *Hyperrhiza* and *Uperrhiza*) may well have been based on a *Scleroderma* rather than a *Melanogaster*; these names can then be rejected as nomina dubia or ambigua, without the formality of conservation. *Argylium* was published in 1833, and therefore is antedated by *Melanogaster*. Apparently then of the listed names the only rival to *Melanogaster* is *Octaviania*, which likewise was published in 1831. It is asserted in the proposal under consideration (and the accompanying one for conservation of *Octaviania*, q.v.) that six of the seven original species of *Octaviania* are species of *Melanogaster*. Zeller & Dodge list *O. ambigua*, *O. rubescens*, and *O. variegata* as accepted and *O. sarcomelas*, *O. odoratissima*, and *O. aurea* as doubtful members of *Melanogaster*; they exclude *O. asterosperma* from consideration as the type of *Octaviania* (Mo. Bot. Gard. Ann. **23:** 603) and designate *O. variegata* as its lectotype. Since *O. variegata* is a species of *Melanogaster*, if their choice be accepted the two genera are synonymous. In that event it would be important to know which was the earlier published; and no evidence on this point is at hand.

As early as 1842 Corda wrote "*Octaviania asterosperma* dürfte die eigentliche Grundform dieser Gattung [*Octaviania*] bilden" (Anleitung 107). It is submitted that thereby he designated the type of the genus. And since it is "established custom" that the first author to designate a lectotype is to be followed (unless, of course, his selection is opposed to cogent indications for another typification, or to exclusion of the lectotype by some earlier student), Corda's decision is entitled to respect. That is true even though it be suspected that his motive was to save *Melanogaster* from synonymy with *Octaviania*.

Zeller & Dodge (Mo. Bot. Gard. Ann. **23**: 603) write "the principle character which [Vittadini] emphasized was the dark color of the spores. . . . He specifically notes that *O. asterosperma* is aberrant in the genus

because of its sterile base and the shape of its spores . . ."; it is on these bases that they exclude *O. asterosperma* from consideration as the type. The words Vittadini used of his genus were "cellulae substantia compacta, demum in pultem brunneo-nigrescentem sporidiiferum fatiscente, repletae. Sporidia nuda ? varia. . . . Caro e sporidiorum colore subnigra." Thus although in the last sentence he explains the dark color of the glebal cavities ("cellulae") by the color of the spores, it is with the fact that they are filled with a "brownish-black pulp" that he is chiefly concerned. Of *O. asterosperma* Vittadini wrote: "Cellulae substantia primitus compacta, humida nigrescente, demum fuscoferruginea, subpulverosa, sporidiifera repletae." This does not depart greatly from the diagnosis of the genus; the glebal cavities of the species are brownish-black. It is true that the spores of *O. asterosperma* are described as "pallide-brunnea"; but those of *O. rubescens* are said to be "pellucida," and those of *O. variegata* "brunnescentia." Vittadini does not therefore mark spore-color as a point of aberration in *O. asterosperma*. And as to the second point, Vittadini does not note "that *O. asterosperma* is aberrant in the genus because of its sterile base and the shape of its spores"; he writes rather: "AFFIN[ITAS.]. Octav. rubescenti vicinus. Differt peridii colore, appendicis basilaris praesentia, ast praecipue sporidiorum forma." That is, it differs from the similar *O. rubescens* in those characters; not from the genus as a whole. It is submitted, then, that *O. asterosperma* is not excluded from consideration by the words of the author of that species, and that Corda should be followed in his designation of the type. If that be done, *Octaviania* (q.v.) is not a synonym of *Melanogaster*, since *O. asterosperma* is not a melanogaster.

Melanogaster has an earlier synonym *Bullardia* Jungh. 1830; nec *Bulliarda* Necker 1790. To judge from the "Examples of orthographic variants" given under Art. 70, these are different names. Since *Bullardia* has not been used since its publication, and *Melanogaster* has been continuously used for a genus of some size and importance, conservation should probably here be employed. The proposal in the Rules is, however, in error in still another point: *M. variegatus* (Vitt.) Tul. 1843 obviously cannot be the type of *Melanogaster* Corda 1831; that genus is monotypic, and its type is *M. tuberiformis*. It is here recommended that the following proposal for conservation be adopted: *Melanogaster* Corda in Sturm, Deutschl. Flora III **3**: 1. 1831 — Type: *M. tuberiformis* Corda — vs. *Bullardia* Jungh., Linnaea **5**: 408. 1830.

MONILIA BON., Handb. Allg. Mykol. 76. 1851 — Type: *M. candida* Bon., l.c. — vs. MONILIA PERS., Mycol. Eur. **1**: 29. 1822; HILL EX FR., Syst. Mycol. **3**: 409. 1832. — Dodge p. 195; Conant pp. 260–265; Ainsworth & Bisby 1943 p. 185, 1945 p. 199.

Dodge does not offer a complete proposal, l.c., but the statement here given is drawn from the details of his discussion except for the citations of the *Monilia* to be rejected, which he does not supply. It must be noted

(1) that *Monilia* is not claimed by Bonorden, but is written by him "Monilia. Hill-Fries. Fries Systema mycol. III, p. 409," and (2) that while the second of the two species described by Bonorden, "*Monilia cinerea m.*" is Bonorden's (the "m." standing for a possessive expression, presumably "mihi"), *M. candida* is not so signed and is by implication the species of some other author, quite certainly Persoon. The genus as treated by Bonorden should then be cited as "*Monilia* Hill ex Fr." (of which the type designated in Syst. Mycol. **3**: 409 is *Mucor caespitosus* L. — i.e., *Monilia digitata* Pers. ex Fr., p. 411); since there is no *Monilia* Bon., it does not matter whether a "sensu Bon." is added to the citation or not.

M. cinerea Bon. "kommt auf faulenden Früchten vor," and is without much doubt the imperfect state of a species of *Sclerotinia* (or *Monilinia*). *M. candida* sensu Bon. "bildet ein wolliges, eine Linie hohes Hyphasma auf faulem Holz"; until one of the fungi of the laboratory or clinic still sometimes referred to as "monilias" is found in nature "forming a woolly mycelium on rotten wood," the fungus Bonorden was describing must be thought a good deal closer to *Monilia* Pers. and *M. candida* Pers., Mycol. Eur. **1**: 29, 30, 1822, than to the monilias of the medical man and bacteriologist. (Note that *M. candida* Pers. is nowhere, by Persoon or Micheli whom he cites, said to have the inflated conidiophore of *Aspergillus*). In brief, there is no *Monilia* Bon. to conserve, and if there were neither of the species which he treated under that name would permit its use for *Monilia* sensu medicorum.

Finally, the name *Monilia* has for so long been so generally attached to various more or less byssoid Moniliaceae that its use for other forms is certain to result in ambiguity and confusion — as in the paper on the genus by Shrewsbury in Jour. Path. Bact. **38**: 313–354. 1934. Because "*Monilia* Bon." is non-existent and inapplicable, and because its employment must occasion confusion, it is here recommended that the proposal be rejected.

Ainsworth & Bisby write "conservation for sp. such as *M. cinerea* Bon. is probably needed." The question of the correct application of the name *Monilia* is thereby brought before the meeting. Its answer depends not only on the answer to the starting-point controversy, but also on the interpretation of the species ascribed to the genus by Persoon and Fries. It appears that at least some of the species of Persoon belong to *Monilia* in a sense quite generally accepted. But because of the dates, it is obviously impossible for *M. cinerea* Bon. to have been included in *Monilia* by either Persoon or Fries. And *M. fructigena* Pers., Syn. 693, which would be equally acceptable, in Persoon's first post-1821 work appears in *Acrosporium* and in Fries's Systema in *Oidium*. There seems to be no early work after the starting point for "Fungi caeteri" in which this species forms a part of *Monilia*. Probably, then, the proposed typification cannot be established. Perhaps the alternative offered by Dodge, "to disregard the name altogether," would be best as well as easiest; the best-known names,

at least, should be displaced by the name of their perfect stage (e.g., *Sclerotinia*, *Monilinia*, *Neurospora*) or have been transferred to other genera (e.g., *Oidium*). Probably *Monilia* could be retained for any light-colored fungus only if conserved against *Monilia* Link ex Gray, Nat. Arr. **1:** 557. 1821 (Dematiaceae). *Monilia* Moench ex Gray, Nat. Arr. **2**: 110. 1821. (Gramineae) is an altered spelling of *Molinia* Schrank, Baier. Fl. 100. 1789; Moench, Meth. Pl. Marburg. 183. 1794; and since it is clearly inadvertent (Gray writes "Monilia" in citing both Schrank and Moench) presumably has no nomenclatorial standing.

Conant discusses the history and application of various names thought applicable to *Monilia* sensu medic., giving the opinion that "*Syringospora* Quinquaud was the first validly published genus" for them, but making no specific recommendation for conservation. Ainsworth & Bisby (1943 p. 47, 1945 p. 52) write "Conservation [of *Candida*] possibly necessary."

MONOTOSPORA SACC. vs. MONOTOSPORA CORDA — Mason 1941 p. 103.

This is another proposal to sanctify an obvious misapplication by the invention of a new genus to be conserved against one long established (see notes under *Acrothecium*). What this motion entails is to father on Saccardo (1880) a generic name published by Corda (1837) and to typify it by a species attributed to the genus by Berkeley & Broome in 1859. One must wonder "Why Saccardo?" It is recommended that the example of Saccardo be followed in writing "*Monotospora* Corda," and that since there is no *Monotospora* Sacc. the proposal be discarded. Ainsworth & Bisby (1943, p. 187) list *Monotospora* as a nomen confusum, but without reference or evidence.

MONTAGNITES FR., Epicr. 240. 1838 — Type: *Agaricus arenarius* DC., Fl. Fr. **6**: 45. 1815 — vs. MONTAGNEA FR., Fl. Scan. 339. 1835; Gen. Hym. 7. 1836. — Morse.

Having twice published the name *Montagnea*, Fries then altered it to *Montagnites* because DeCandolle by changing the generic name *Montanoa* Cerv. apud Llave & Lexarza, Nov. Veg. Descr. **2**: 11. 1825, to *Montagnaea* DC., Prodr. **5**: 564. 1836, had created an approximate homonym. As Montagne first (Syll. Gen. Spec. Cryptogam. 129–130. 1856) and Zeller most recently (Mycologia **35**: 418. 1943) pointed out, *Montagnea* Fr. as published in the Gen. Hym. antedates *Montagnaea* DC. by half a year, and *Montagnaea* is in itself invalid, being a superfluous name for *Montanoa*. Furthermore, *Montagnea* Fr. was published even earlier, in 1835, and in any case the names *Montagnea* and *Montagnaea* are not homonyms, differing as they do in spelling, in pronunciation, and in derivation (the person commemorated). In first describing *Montagnea* Fries enumerated no species; in 1836 he named one, *A. arenarius*, as an example of the genus; that then should be taken as the type, both of *Montagnea* and the substituted name *Montagnites*.

The author proposes the conservation of *Montagnites* on the grounds

that "*Montagnites candollei* was promptly adopted in all the literature." As noted, Montagne himself, whose name was to be immortalized in one generic name or the other, used *Montagnea*, and protested against the altered form; *Montagnea* was also used in Corda, Icones **6**: 85. 1854. Since the termination *-ites* is so usefully employed as the indication of a genus of fossils, its use for a living group is anomalous and misleading. A name formed with that termination cannot be rejected on that account, but when it is already clearly and abundantly invalid, it would appear better not to attempt special action to retain it. It is recommended that the proposal be rejected.

MUTINUS FR. vs. AEDYCIA RAF. and CYNOPHALLUS (FR.) CORDA — IR p. 124; IRA p. 41; BMS 2 p. 285.

The B.M.S. Committee has added a second nomen rejiciendum to the one proposed in the appendix to the Rules; and there is a third which must also be considered, *Ithyphallus* Gray (see also notes under *Phallus*). The proposal should read: *Mutinus* Fr., Summ. Veg. Scand. 434 (1849) — Type: *M. caninus* (Pers.) Fr., l.c. — vs. *Aedycia* Raf., Jour. Bot. Soc. Bot. [Desvaux] **1**: 222. (1808); *Ithyphallus* Gray, Nat. Arr. Brit. Pl. **1**: 675. 1821; and *Cynophallus* (Fr.) Corda, Icon. Fung. **5**: 29. 1842; Einleitung Stud. Mycol. lxxxv, 119, pl. E, 51, fig. 1–8. 1842. (The B.M.S. committee reports that "Corda [Icones] . . . did not make the binary combination"; but two binomials in *Cynophallus* appear in the *Anleitung*.) As by the British committee, it is here recommended that the proposal be adopted; this recommendation was approved also by Dr. S. M. Zeller.

MYCOBONIA PAT. vs. HIRNEOLA FR. — Donk 1941 pp. 157, 173, 170.

The author points out that *Mycobonia* and *Hirneola* 1825 (non *Hirneola* Fr. 1849, q.v.) are obligate synonyms. The genus is small and of no importance; nevertheless, *Hirneola* has been so widely used in its illegitimate application for auricularias with a "superior hymenium" that to allow it to stand in its legitimate application, for a hydnum-like fungus, would be to establish a nomen ambiguum, "a permanent source of confusion or error." *Hirneola* Fr. 1825 must then be rejected under Art. 62. The rejection of *Hirneola* Fr. does not, however, of itself permit the use of *Mycobonia*, since the latter name is illegitimate under Art. 60(1) as amended at Amsterdam (see citation in the discussion under *Sordaria*). *Grandinioides* Banker, Torrey Bot. Cl. Mem. **12**: 179. 1906, is another obligate synonym illegitimate for the same reason. The genus is quite small and of no particular importance; nevertheless, because it has no legitimate name at present, it is recommended that the proposal be adopted. The alternative is the publication of a new name.

MYCOLEPTODON PAT. vs. ODONTIA FR. 1835, 1836, nec ODONTIA PERS. ex BANKER 1929 — Donk 1941 pp. 157, 174.

Although the author of the proposal wrote "*Odontia* Fr. (non Pers.)," there must be some doubt whether there is a genus *Odontia* Fr. In Syst.

Mycol. **1**: 415. 1821 Fries cites *Odontia* Pers. as a synonym of his Trib. *Resupinatus* of *Hydnum*; in Fl. Scan. 340. 1835 he keys out a genus *Odontia*, but gives neither its author nor its species; in Gen. Hym. 13. 1836 he gives a diagnosis and designates a type species, *Sistotrema fimbriatum* Pers., again giving no author for the genus; in Epicr. 528 he gives descriptions of five species of *Odontia*, with no authority for the genus, but only a reference to "Gen. Hymen." Not until 1849, in Summ. Veg. Scand. 329, does he write the genus "*Odontia. Fr.* Hydni sp. *P.*[*ers.*]"; in Hym. Eur. 627. 1874 he similarly ascribes the genus to himself. It may be that by 1849 he had forgotten that in 1821 he had ascribed the genus to Persoon; but in view of that fact, and of the fact that the species which Fries designated as the type of *Odontia* was first published as *Odontia fimbriata* Pers., Obs. Mycol. **1**: 88. 1796, and is so cited in Pers. Syn. Meth. Fung. 553 under the name *Sistotrema fimbriatum* to which Fries refers in designating the type, it would seem that the genus as he used it should be cited as *Odontia* Pers. ex Fr. rather than as a brain-child of Fries. In addition, whether or not there is an *Odontia* Fr., Fries's first use of the name for an autonomous genus is long antedated by *Odontia* Pers. ex Gray, Nat. Arr. **1**: 651. 1821, of which it can at most be a later homonym.

The retention of Patouillard's name *Mycoleptodon* would not appear to be a matter of great importance. Donk, Nederl. Mycol. Ver. Med **18–20**: 190. 1931, makes it a synonym of *Gloiodon* Karst.; Miller, Mycologia **25**: 296. 1933, and Miller & Boyle, Univ. Iowa Studies Nat. Hist. **18(2)**: 45. 1943, make it a synonym of *Steccherinum* Gray; Bourdot & Galzin, Hym. France 440. [1928], include in it the type species of both *Odontia* and *Steccherinum*, so that as they use it the name must fall into synonymy under one or the other of those genera.

It is possible that at some future time action will have to be taken on the name *Odontia*. But it is greatly preferable that the taxonomy, and especially the delimitation of natural genera, within the non-stipitate Hydnaceae be first more greatly perfected. It is recommended that the proposal be rejected.

MYTILIDION SACC. vs. MYTILINIDIÒN DUBY — IR p. 122; IRA p. 41; BMS 2 p. 284.

There is no *Mytilidion* Sacc.; Saccardo ascribed *Mytilidion* to Duby, and intended to do no more than correct Duby's faulty word-formation. As pointed out by the B.M.S. committee, this correction is forbidden by the Rules. It would appear that to make Saccardo's spelling sacrosanct would not "avoid disadvantageous changes in the nomenclature of genera" (Art. 21), and that in consequence this motion cannot be entertained under the provisions for conservation. The proposal should be rejected.

NIDULARIA FR. vs. GRANULARIA ROTH — IR p. 127; IRA p. 41; Bisby p. 106.

The proposal is to conserve a name published for a gasteromycete in 1818 against one published in 1791. Since under the International Rules

names published for gasteromycetes before 1801 have no standing in any case, the proposal must have been put forward under some other rules.

Granularia was published in Ann. Bot. (Usteri) **1**: 6. 1791, by Roth (and not, as stated in Gmel., Linn. Syst. Nat. ed. 13 **2(2)**: 1487. 1796, by Willdenow). Its first use as a genus subsequent to 1801 seems to have been by Link, in Nees, Horae Phys. Berol. 6. 1820, who attributed it properly to Roth. Since *Nidularia* was published by Fries in 1818, there appears to be no need to conserve it. The proposal should be rejected.

NUMMULARIA TUL. vs. BISCOGNIAUXIA OK. — IR p. 121; IRA p. 41.

NUMMULARIA TUL. vs. NUMMULARIA GILIB. — IR p. 127; BMS 1 p. 219; Miller 1932 p. 131, 1941 p. 74.

Providing that taxonomists of vascular plants can do without *Nummularia* as employed by a few recent authors for a section of *Lysimachia*, and provided mycologists can properly employ the name, an excellent case on nomenclatorial grounds is presented in BMS for the conservation of *Nummularia* Tul. Since the generic name is taken from that of one of its species, *Hypoxylon nummularium* Bull., in the absence of typification by its authors it would be difficult to choose any other as the type species. The lists in IR and the discussion in BMS all consider *N. Bulliardi* Tul. (≡ *H. nummularium* Bull.) the genotype. Miller, however, who considers *N. Bulliardi* inseparable from *Hypoxylon* and *N. discreta* a member of an autonomous genus, lists the latter as the type of *Nummularia*. In their original publication of the genus the Tulasnes included the following (Sel. Fung. Carpol. **2**: 43): "*Nummulariae* characteres traximus ex *Hypoxylo nummulario* Bull. et *Sphaeria discreta* Schw. quae pro generis typis habere decet." The designation of two types for one name does not settle the nomenclatorial problem under discussion, but it does make possible a later selection; Miller's choice is no more excluded than is the alternative. The question is whether *N. discreta* and related forms are left without a generic name by the designation of *N. Bulliardi* as type; and this question is taxonomic rather than nomenclatorial. Miller's taxonomic conclusions will certainly be accepted by many mycologists. For these workers, if *N. Bulliardi* be designated as the type, *Nummularia* becomes a useless synonym of *Hypoxylon* and another generic name must be found for *Sphaeria discreta*. If the latter be designated as the type, *Nummularia* can be used both by those who consider the two species congeneric and by those who separate them. It is therefore recommended that *Nummularia* Tul., with the type *Sphaeria discreta* Schw., be conserved against *Numularia* Tragus ex Gray, Nat. Arr. **2**: 300 (p. 748 ut "*Nummularia*"). 1821.

The B.M.S. report recommends that the nomen rejiciendum be written *Nummularia* Gronov. Fl. Virg. ed. 2, 26 (1762). In the place cited is found "NUMMULARIA *aquatica Becabungae foliis*, ad genicula florens, flore albicante tubulato, caule rubente succulento, radice repente. *Clayt.*" Above it are found two lysimachias treated in similar fashion, and on the opposite page three azaleas so discussed. It is submitted that this is not

a generic description of *Nummularia*, any more than there are three generic descriptions of *Azalea* on the next page, but that it is a specific description of *Nummularia aquatica Becabungae foliis*. The fact that the quoted material is copied in 1762 without change except (erroneously) in type-face from the first edition of Gronovius, which is pre-binomial, bears this out. The page of Gilibert's work on which *Nummularia* is said to have been published is not at hand for examination; but since in the greater part of his Fl. Lituan. he describes only species, and not genera, it is tentatively assumed that he did not publish *Nummularia*. There seems to be no post-Linnaean publication of the generic name before 1821; and therefore it is here attributed to Gray, who validly published the genus. Other possible uses by early authors of *Nummularia* would automatically be rejected by this action. *Biscoigniauxia* Tul. would similarly be discarded without formal rejection.

OCTAVIANIA VITT. vs. OCTAVIANINA OK. — IR p. 124; IRA p. 41; Bisby p. 105.

Since Vittadini's name antedates Kuntze's by over sixty years, it clearly cannot be replaced by the latter if the two are synonymous. If they are not, there is even more clearly no case for conservation. It cannot be too often emphasized that conservation is authorized only "to avoid disadvantageous changes in the nomenclature of genera by the strict application of the Rules of Nomenclature." In this proposal and others like it, then, there must be some showing of a Rule whose "strict application" would produce "disadvantageous changes." None appearing, it is strongly recommended that the proposal be rejected.

It may be that here conservation is proposed as a ruse to settle authoritatively the question whether *Octaviania* and *Octavianina* are in fact synonyms. If so, that is not a legitimate purpose of conservation nor would the question be in any degree settled by conservation. In these notes it is given as an opinion (under *Melanogaster*) that the type of *Octaviania* is *O. asterosperma*. If that opinion be followed, the question of the synonymy of the genera is settled legitimately: *O. asterosperma* being presumably the type of both *Octaviania* and *Octavianina*, Vittadini's name stands without conservation, and supersedes both *Octavianina* and, presumably, *Arcangeliella* Cav.

OLPIDIOPSIS CORNU vs. PLEOCYSTIDIUM A. FISCH. and DIPLOPHYSA SCHROET. — IR p. 120; IRA p. 41; Bisby p. 101.

The bare proposal — all that seems to have been published on this case — seems completely pointless; *Olpidiopsis* antedates the two proposed nomina rejicienda by, respectively, twelve and seventeen years. Until it is made clear which rule it is whose "strict application" would invalidate *Olpidiopsis*, the motion is not in order. It should be rejected.

Although it is not so stated, the concern of this motion and the one to conserve *Pseudolpidium* (q.v.) seems to be with the intricacies and merits

of sensu and emendavit. In the main, it would seem preferable to leave the determination of the characters of a particular fungus to those who are working with the group to which it belongs. There is one correction which should, however, be made in the citation. *Olpidiopsis Saprolegniae*, which from Cornu's treatment is clearly the type of the genus, was explicitly published as a new combination for *Chytridium Saprolegniae* A. Braun, and must therefore be written "(A. Braun) Cornu." In transferring the epithet Cornu observed that Braun's fungus was not adequately characterized, but that "ce nom mérite cependant d'être conservé" (Ann. Sci. Nat. Bot. v **15**: 144. 1872); an "emendavit Cornu" may then be added to the citation. But if it could be shown that Cornu's fungus was different from Braun's, there could under the Rules (Art. 54 as amended at Amsterdam; see citations in the discussion under *Massaria*) be only one *O. Saprolegniae* — that represented by Braun's fungus; the *Pseudolpidium Saprolegniae* (A. Braun) and *Olpidiopsis Saprolegniae* (Cornu) offered by A. Fischer (in Rabenh. Krypt-Fl. 2 Aufl. **1 Bd. 4 Abt.**: 35, 38. 1892) are obligate synonyms.

OPHIOSTOMA H. & P. SYD., Ann. Mycol. **17**: 43. 1919 — Type: *Sphaeria pilifera* Fr., Syst. Mycol. **2**: 472. 1823 — vs. ENDOCONIDIOPHORA MÜNCH, Naturw. Zeits. Land. Forstw. **5**: 564. 1907 — Melin & Nannfeldt pp. 402–405.

Nannfeldt, l.c., states that the two names in question "will . . . become synonymous," and that "the name *Endoconidiophora* is the older and ought to be used for the enlarged genus." But since it "was intended explicitly for species with endogenously formed conidia, as the name implies," it would, he maintains, only cause misunderstanding to use it in the broader sense. He therefore proposes the conservation of *Ophiostoma*, which "is hardly used at all" and therefore would not be so confusing. However convenient it would be to select from a number of names the most apt, and to reject inept nomenclature, it is expressly forbidden under Art. 59; furthermore, it does not appear that conservation of *Ophiostoma* would accomplish the purposes set forth in Art. 21. It is therefore recommended that the proposal be rejected.

PANUS FR. vs. RHIPIDIUM WALLR. — IR p. 124; IRA p. 41; Donk 1941 p. 192; Singer & Smith 1946 pp. 255, 257.

PANUS FR. vs. PLEUROPUS GRAY — Singer & Smith 1946 pp. 250, 292.

Donk considers *Rhipidium* Wallr. a later homonym of *Ripidium*, earlier used by two authors, and the proposal for conservation therefore superfluous. Singer & Smith state that *Rhipidium* Wallr. is a synonym of *Schizophyllum* and therefore does not conflict with *Panus*. If *Rhipidium* Cornu be conserved, as recommended under that heading, Wallroth's name is even more surely discarded. It is recommended here also that the IR proposal be rejected.

In addition, however, Singer & Smith note that *Pleuropus* Gray (1821)

includes two species of *Panus* and a species of each of three other genera with which it would similarly conflict. They have chosen so to typify *Pleuropus* that it becomes an earlier synonym of *Panus* rather than of the other genera, and have proposed the conservation of *Panus* vs. *Pleuropus*. Their taxonomic decisions are here accepted, and their proposal seconded.

PAXILLUS FR. vs. RHYMOVIS PERS. and RUTHEA OPAT. — IR p. 124; IRA p. 41; Donk 1941 p. 192; Bisby p. 105; Singer & Smith 1946 pp. 257, 258, 293.

Donk correctly points out that *Paxillus* was published in 1835, thus antedating *Ruthea*, and that *Rhymovis* (which Persoon corrected, in the volume where it first appeared, to *Rhymoxis*) was not validly published in 1828, nor until after the appearance of *Paxillus*. He therefore states that the proposal is superfluous, and implies that it should be rejected. Singer & Smith agree to this, providing it is shown that *Paxillus* has priority. They did not take into account the Fl. Scan., which establishes this priority; to Donk's recommendation and theirs for the rejection of the proposal a third is here offered.

The correct citation for *Paxillus* is Fr., Fl. Scan. 339 (not 329). 1835.

PERISPORIUM FR. vs. ? — Ainsworth & Bisby 1943 p. 217; 1945 p. 232.

The proposal reads as follows: "Conservation necessary with *P. vulgare* Corda as type." Since there is no indication of the generic name which "by the strict application of the Rules" would displace *Perisporium* Fr., nor of the Rule under which Fries's name would be changed, this proposal is not in form for consideration. Fries described *Perisporium* in S.O.V. 161. 1825, and both the genus and sixteen species in Syst. Mycol. **3**(**1**): 248–253. 1829. There seems to be no earlier homonym. Since *P. vulgare* Corda is not one of the original species, if it later appears that *Perisporium* must be conserved another lectotype must be designated. It is recommended that the present proposal be rejected.

PERICONIA BON. vs. PERICONIA TODE EX FR. — Mason 1941 p. 123; Ainsworth & Bisby 1943 p. 216, 1945 p. 231.

After 1821 *Periconia* seems first to have been described by Link, Linn. Sp. Pl. ed. 5 (Willdenow) **6**(2): 109. 1825, for *P. byssoides* Pers., *P. subulata* Nees, and *P. nana* Ehrenb. Later in the same year Fries described the genus in Syst. Orb. Veg. 229, without description of species; he mentioned, l.c., "*Periconia Persicae, Robiniae.*" (For relative dates of Fries and Link, note that on pp. 361 and 365 of the S.O.V. Fries cites Link's work). In 1832 (Syst. Mycol. **3**(2): 307) Fries published a fuller description of the genus and a description of *P. Lichenoides*, Tode's original (pre-Friesian) species. The type of *Periconia* Link can then be *P. byssoides* or one of the other species listed; of *Periconia* Tode ex Fr., *P. Lichenoides*.

In 1851 Bonorden published descriptions of "*Periconia* Persoon" and of ten species (Handb. 112). The Persoon treatment in question is presumably that in Syn. Meth. Fung. 686, where *P. lichenoides*, *P. byssoides*,

and *P. stemonitis* are described. There is then no "*Periconia* Bon.", nor any reason to ascribe the genus to Bonorden, since if *P. lichenoides* is the type *Periconia* Pers. ex Bon. is the same as *Periconia* Tode ex Fr., and if either of the other species is the type it is the same as *Periconia* Link (Link having listed *P. stemonitis* as a synonym of his *P. subulata*).

Ainsworth & Bisby write "Conservation necessary, see Mason, 1941." Mason does not, l.c., propose conservation nor state that it is necessary. It is here submitted that *Periconia* Link is the correct designation for the genus; but under a different interpretation of the starting-point rule one would write *Periconia* Tode ex Fr. — and thereby change the type. In the absence of published arguments for the occasion or the desirability of conservation, it is recommended that the proposal be rejected. See *Periconia* among the later notes on nomina confusa.

PEZIZA FR. vs. ALEURIA FUCK. — IR p. 121; IRA p. 41; BMS 2 p. 281.

Since *Peziza* Fr. antedates Fuckel's name by forty-eight years, the proposal for conservation is unnecessary and should be rejected. Here as elsewhere, matters of choosing lectotypes can better be dealt with by experts than by a general committee, and should be left to the monographers.

PHALLUS PERS. vs. ITHYPHALLUS (FR.) FISCH. — IR p. 124; IRA p. 41; BMS 2 p. 284.

Since *Phallus* Pers., published at the very starting-point of nomenclature for the group to which it belongs, antedates *Ithyphallus* Fisch. by eighty-seven years, it is in no need of conservation. If *Ithyphallus* Fisch. were not invalidated by its late date of publication, it would still be rejected as a later homonym of *Ithyphallus* Gray, Nat. Arr. **1**: 675. 1821 (see notes under *Mutinus*). The proposal should be rejected.

PHELLINUS QUÉL. vs. PORIA PERS. EX KARST. — Donk 1941 pp. 158, 174, 176.

Since *Poria* Pers. ex Gray antedates *Poria* Pers. ex Karst. (see below under *Poria*) and has a different type, the use of the name *Poria* here proposed for rejection is automatically rejected on grounds of priority, and does not compete with *Phellinus*. The proposal is therefore unnecessary, and should be rejected.

PHLEOSPORA WALLR. vs. SEPTORIA FR. — IR p. 125; IRA p. 41; BMS 3 p. 291.

SEPTORIA SACC. vs. SEPTORIA FR. — BMS 3 p. 291.

The genus *Phloeospora* (not *Phleospora*) was published by Wallroth for two species — *P. Ulmi* (Fr.) and *P. Oxyacanthae* (Kuntze). Under the first species the author lists with the synonyms "Phloeospora Ulmi Wallr. in lit. 1815" and writes "a me ab anno 1810 inde observata itaque dicta." The second he treats more briefly, calls "rarior," and appears to have known from the descriptions or, perhaps, specimens of others. *P. Ulmi* is then clearly the species on which the genus was chiefly based; ergo, its

type. He gives "Septaria Kunz. Fr." as a synonym of the genus — that is, *Phloeospora* is a new name for *Septaria* of Kunze and of Fries.

Septaria was described by Fries in Novit. Fl. Suec. (Part V) 78. 1819; the type was designated as *S. Ulmi*. The first publication of the name after 1821 appears to be *Septaria* Fr. ex Kunze, Mykol. Hefte **2**: 107. 1823; there *S. Ulmi* Fr. is described at length and a shorter treatment is given of *S. Oxyacanthae* Kunze. In S.O.V. 119, 195. 1825 Fries himself again described the genus, changing the name to *Septoria* ("Olim *Septariam* dixi, quod nomen ob animal homonymon paululum mutavi."); no species are there listed. In Elench. **2**: 117. 1828 Fries gave an extended discussion of *Septoria*, listing, in addition to his own *S. Ulmi*, *S. Oxyacanthae* Kunze and *S. Fraxini* (DC.). In Syst. Mycol. **3**: 480. 1832 he published a further note on *Septoria*, observing that Desmazières had added some species. These additional species Fries neither described nor accepted, nor did he even indicate that he was acquainted with their characters. Whether the spelling of the genus is *Septaria* or *Septoria* depends on one's interpretation of the starting-point rule, Art. 20 (f); there can be no doubt that the type of the genus, whether *Septaria* Fr. ex Kunze or *Septoria* Fr., is *S. Ulmi* and that *Phloeospora* Wallr. is an obligate synonym. Finally, in Summ. Veg. Scand. 426. 1849 Fries wrote "Species typicae, v.c. *S. Ulmi*, *Oxyacanthae* . . ."

The second proposal is to conserve *Septoria* Sacc., Syll. Fung. **3**: 474. 1884 against *Septoria* Fr. 1828. There is no *Septoria* Sacc.; what Saccardo treats, l.c., is "*Septoria* Fr. S.M. III. p. 480, emend. Sacc. Mich. II. p. 6." In Michelia, l.c., Saccardo includes *S. Ulmi*, Fries's type, making it doubly certain that there is no genus *Septoria* Sacc. "definitely accepted by the [alleged] author" (Art. 37 as amended at Amsterdam; cf. Zesde Int. Bot. Congr. Proc. **1:** 365; IRB p. 76; IRA p. 13).

The conservation of a non-existent name being impossible (see discussion under *Acrothecium*), the second proposal should be rejected. If the use of *Septoria* in its correct sense should produce confusion because of later misuse of the name, it can be rejected as a nomen ambiguum. There is no obstacle to the adoption of the first proposal (except that *Phloeospora* Wallr. is misspelled in IR); if it be found desirable to retain Wallroth's name, that may well be done. From lack of knowledge of the nomenclatorial consequences, no recommendation is offered here.

PHLYCTIDIUM (BRAUN) RABENH. VS. PHLYCTIDIUM WALLR. — Sparrow p. 147; Ainsworth & Bisby 1945 p. 239.

Because of the existence of Wallroth's earlier homonym, which appears no longer to have any currency, it is proposed to conserve *Phlyctidium* (Braun) Rabenh. For this genus there is already a valid name, *Tylochytrium* Karling, Mycologia **31**: 287. 1939. *Phlyctidium* was first published by Braun, as a name for a subgenus of *Chytridium*, to include the largest part of the genus (16 species out of 22); the lectotype of the subgenus and of the genus based on it must come from among these 16 original

species. Sparrow includes all 16, as synonyms or as accepted or doubtful species, in other genera, leaving the name *Phlyctidium* for a group of fungi ostensibly not congeneric with any of the original species. It is submitted that for this group some other name ought to be used, as prescribed in Art. 18 (or, since Sparrow considers it of doubtful distinctness, that it ought to be abandoned), and that *Phlyctidium* (Braun) Rabenh. may well be relegated to oblivion under the operation of Art. 61. It is recommended that the proposal be rejected.

It would be possible, under Art. 47 (see discussion under *Phoma*), to maintain that there is a genus *Phlyctidium* Sparrow 1943, and to propose its conservation. But it appears obvious that no author would wish to (1) exclude all the original species from a genus, (2) claim authorship of the genus on the grounds that he thereby excluded the type, and in the same work (3) propose for conservation the genus thus erected; and that in the case in question the "exclusion of the type" was inadvertent.

PHOMA DESM. NON FR. vs. SPHAEROPSIS LÉV. — IR p. 125; IRA p. 41; BMS 2 pp. 288, 289.

PHOMA DESM. vs. PHOMA FR. — BMS 2 p. 289.

On the showing of the B.M.S. committee *Sphaeropsis* Lév. (q.v.) is monotypic, and its type is not congeneric with *Phoma* in any sense. As a consequence, the two names do not conflict, and the IR proposal is out of order. *Sphaeropsis* Lév. "emend. O. Kuntze" has of course no standing whatever. The proposal should be rejected.

Phoma Fr., Syst. Mycol. **2**: 546. 1823, was published for five species. Of these *P. Filum* was excluded two years later by Fries himself (Syst. Orb. Veg. 120); thereby the number of species eligible as lectotype was reduced to four: *P. saligna*, *P. Populi*, *P. pustula*, and *P. tularostoma*. Of these *P. tularostoma* should be excluded from consideration on the ground that Fries had never seen it, whereas he studied living material of *P. saligna* and *P. pustula* and dried material of *P. Populi*. Although *Phoma* Fr. as described in Novit. Fl. Suec. 80. 1819 is pre-Systema and invalid, it is certain that any indication there given of the species Fries had chiefly in mind in describing the genus is a cogent one; and there Fries listed only one: "Typus: *Sph. pustula* P." It is submitted that *Sphaeria pustula* Pers. is therefore not only an acceptable lectotype but the immutable type of *Phoma* Fr.

It is proposed in BMS to conserve against *Phoma* Fr. the genus *Phoma* Desm. 1849. In Ann. Sci. Nat. Bot. iii. **11**: 278. 1849 (which is the 16th Notice, not 13th, as given in IR) Desmazières gives a long description and a longer discussion of "*Phoma* Fr., Corda, Mntg., etc. emend.", and descriptions of ten species. So much would, of course, forbid the attribution of *Phoma* to any author besides Fries.

To the straightforward and uncomplicated taxonomic intelligence this would appear to be another case of the mere addition to a genus of alien species. Unfortunately, the Rules do not seem to have been composed for

or by such an intelligence. It is pertinent here to note an accretion (italicized) to Art. 47 adopted at Amsterdam: "An alteration of the diagnostic characters or of the circumscription of a group *without exclusion of the type* does not warrant the citation of an author other than the one who first published its name" (Zesde Int. Bot. Congr. Amsterdam Proc. **1:** 344; IRB p. 81; IRA p. 16). This phrase "without exclusion of the type" appears to imply an impossibility: since "a nomenclatorial type is that constituent element of a group to which the name of the group is permanently attached" (Art. 18), it would seem that exclusion was excluded by the definition of "type."

To the authors of the Rules nothing, apparently, has seemed impossible; and in consequence those who follow them are compelled to remain on the alert, to discover whether there exists a case of "exclusion of the type," and to stigmatize it in the manner implied by Art. 47. It is submitted that if such a case exists it is here. For on p. 279 Desmazières writes, "Le *Phoma pustulata*, Fr., est un *Sphaeria*." Since Fries had not published a *P. pustulata*, it seems clear that the reference is to *P. pustula*. Thereby Desmazières explicitly excluded the type from the genus *Phoma*; and in consequence it could be considered permissible under the amended Art. 47 to cite Desmazières as author of a genus *Phoma*. If that were done it would not, however, be permissible to designate *P. herbarum* Westend. as the lectotype of Desmazières's genus, since *P. herbarum* is not among the species included, l.c. The choice of a type, from among the ten species described by Desmazières, should be made by one acquainted with the species involved.

So much for Art. 47 and its bearing on the case in question. As already noted, the principles of the type method, insofar as they are included in the Rules, are set forth in Art. 18. It is submitted that where a subsidiary provision, like the phrase "without exclusion of the type" appears to conflict with Art. 18 the latter must be authoritative. Now whereas Art. 47 may be thought to imply that exclusion of the type warrants the citation of an author other than the one who first published the name, Art. 18 states unequivocally that "The name of a group must be changed if the type of that name is excluded." That statement is the essence of the type method, and is accepted as such, both by those who follow and those who reject it; if that statement were deleted, or its provisions relaxed, the type method would thereby be eliminated from the Rules. Whatever permission seems to be granted by Art. 47 for changing the *author*-citation, no evasion is permitted by Art. 18 of the obligation to change the name; and whereas the former may allow one to write "*Phoma* Desm. non Fr.", the latter requires that even though the group *Phoma* Desm. is recognized as an autonomous genus (and legitimately typified) it be called by another name.

It is here admitted that the application of Art. 18 can in such a case as this be avoided by conservation; because of the equivocal nature of Art. 47 and the great importance of the preservation of Art. 18 it is recommended

that no conservation be here attempted. See notes under *Sphaeropsis* and *Hypospila*. A motion is being published (Mycologia **41:** 215–219. 1949) to delete the phrase "without exclusion of the type."

PILACRE (FR.) WEINM. vs. PHLEOGENA LK. — IR pp. 123, 127; IRA p. 41; Donk 1941 p. 193.

The "*Phlogiotis*" printed as an alternative name to *Pilacre* probably was dropped a line (in IR) from the preceding proposal. It has nothing to do with *Pilacre*.

What the authors of the proposal under discussion meant by "(Fr.) Weinm." is not clear; they would seem to imply that *Pilacre* was published in some infrageneric rank by Fries and elevated to generic rank by Weinmann. As a matter of fact, *Pilacre* was originally published as a genus, by Fries, in S.O.V.; its type is a Weinmann fungus, "Stilbum incarnatum *Weinm. in litt.*" (*Pilacre Weinmanni* Fr., Syst. Mycol. **3**: 204. 1829). Neither Fries nor Weinmann ever included in it the name of the proposed lectotype, *P. Faginea*. For a good many years there has been discussion concerning the identity of *P. Weinmanni*. Earlier discussions are summarized by Costantin (Jour. de Bot. **2:** 299. 1888) and Boudier (Jour. de Bot. **2**: 261. 1888); these authors are agreed that it is an ascomycete; Boudier states that it is the same as *Roesleria*. Juel, Shear & Dodge (Jour. Agr. Res. **30:** 413. 1925), and Donk think it more probable that the species is a lichen. One thing is certain from Fries's generic description and Weinmann's manuscript name: *P. Weinmanni* has no more relation to *Phleogena*, the basidiomycete, than has *Phlogiotis*. Donk, Martin (Univ. Iowa Studies N. H. **18**(3): 69. 1944), and other mycologists use the valid name *Phleogena*; although they do not use that name, Shear & Dodge (l.c. p. 414) state that *Phleogena* is "the oldest valid name." The proposal should be rejected.

PLEUROTUS (FR.) QUÉL. vs. PTEROPHYLLUS LÉV. — Donk 1941 pp. 158, 175; Singer & Smith 1946 p. 260.

PLEUROTUS (FR.) QUÉL. vs. CREPIDOPUS (PERS.) EX GRAY — Singer & Smith 1946 pp. 250, 260, 294.

Both proposals seem to be in order; and since *Pleurotus* is used for a common and relatively important genus, it is recommended that both be adopted.

The authors of the second proposal cite *Crepidopus* twice as "(Pers.) ex Gray" and once (p. 266) as "Nees v. Esenb. ex Gray." Gray attributes the name to "Esenbeck" (the reference would presumably be Syst. Pilze Schwamme 195. 1817), and "Nees ex Gray" would seem the preferable form.

Pleurotus (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5**: 62 (and should be so cited) and in Ch. Jura Vosges 23. Quélet used the spellings *Pleurote* and *Pleuropus* on, respectively, pp. 111 and 325 of the first and pp. 77 and 313 of the second of the cited works. See note

under *Flammula*. It seems unlikely that the name *Pleuropus* as used by Quélet was anything but an unintentional misspelling, or that it has anything to do with *Pleuropus* Gray (see notes under *Panus*).

PLOWRIGHTIA SACC. vs. DOTHIDELLA SPEG. — IR pp. 122, 127; IRA p. 42; BMS 3 p. 286.

According to the evidence presented in BMS, the type of *Dothidella* is *D. australis* Speg. and the genus is not synonymous with *Plowrightia*. Their recommendation to reject the proposal is here seconded.

PODOSCYPHA PAT. vs. CRATERELLA KARST. — IR p. 123; IRA p. 42; Donk 1941 p. 194.

Since *Craterella* Karst. 1882 is a later homonym of *Craterella* Pers. ex Gray, Nat. Arr. **1**: 652. 1821, it is rejected without special action. The type of Gray's genus is *C. caryophyllea*, a member of *Thelephora* or *Phylacteria* (according to the classification employed), and not congeneric with the members of *Podoscypha* Pat. Since conservation is therefore not needed to preserve Patouillard's name, the proposal should be rejected.

PORIA (FR.) KARST. EMEND. SACC. vs. PHYSISPORUS GILL. — IR p. 123; IRA p. 42; BMS 1 p. 226; Cooke p. 85; Ainsworth & Bisby 1943 p. 243; 1945 p. 260; Bisby p. 104.

PORIA PERS. EX CKE. vs. PHYSISPORUS CHEV. and PORIA PERS. EX KARST. — Donk 1941 pp. 158, 174, 176.

Since *Poria* Pers. ex Gray was published (Nat. Arr. **1**: 639) in 1821, it antedates the proposed nomina rejicienda and stands without conservation; and it is *Poria* in the currently accepted sense. The proposals are therefore unnecessary (as noted by Ainsworth & Bisby) and should be rejected. See notes under *Phellinus*.

PORODISCULUS MURR. vs. ENSLINIA FR. — IR p. 123; IRA p. 42; Donk 1941 p. 195.

It is stated by Donk, as in IR, that *Enslinia* Fr. is a later homonym of *Enslinia* Reichenb. The entry in Reichenbach's Conspectus carries no description, consisting merely of the following: "3428. Enslinia Nutt." It seems unnecessary to insist upon the necessity in earlier works of all the machinery of citation expected of more recent authors, and the "Nutt." may be accepted as the "reference" required for effective publication under Art. 37. Even if that be not granted, *Enslinia* Fr. appears, under Art. 70, note 3, and "Examples of orthographic variants," to be a homonym of *Enslenia* Nutt. In either case, *Enslinia* Fr. is already rejected, and does not compete with *Porodisculus*. Donk's recommendation that the proposal be rejected is here seconded.

Enslinia Fr. was published in Fl. Scan. 347. 1835.

PSATHYRA (FR.) QUÉL. vs. PSATHYRA COMMERS. EX SPRENG. — Ainsworth & Bisby 1943 p. 246, 1945 p. 263; Singer & Smith 1946 p. 265.

The conservation of *Psathyra* as a generic name for agarics is desirable; from meager information at hand it seems unlikely that the earlier homonym *Psathura* Commers. ex Jussieu, Gen. Pl. 206. 1789 (and its variant spelling *Psathyra* Commers. ex Spreng., Anleit. Kenntn. Gew. 2 ed **2**(2): 614. 1818) of the Rubiaceae will be relinquished by taxonomists of vascular plants. The possibility of agreement should be investigated in consultation with the appropriate special committee. If it proves possible to conserve *Psathyra*, some other type than *P. spadiceo-grisea*, the species nominated by Singer & Smith, must be chosen; that species was not included in *Agaricus* Trib. *Psathyra* Fr., Syst. Mycol. **1**: 295.

Psathyra (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5**: 148 (and should be so cited) and in Ch. Jura Vosges 118. See notes under *Flammula*.

PSEUDOGRAPHIS NYL. vs. KREMPELHUBERIA MASSAL. — IR p. 122; IRA p. 42; BMS 3 p. 287.

On the showing of the B.M.S. committee there is no obstacle to the conservation of *Pseudographis*. If the name be considered of sufficient importance, it may well be conserved.

PSEUDOLPIDIUM A. FISCH. vs. OLPIDIOPSIS CORNU — IR p. 120; IRA p. 42; Bisby p. 101.

This motion is correlated with that earlier discussed, to conserve *Olpidiopsis* (q.v.) against two later genera. The proposals make a curious pair — the one, to conserve *Olpidiopsis* Cornu emend. A. Fisch. 1892, and the other to reject *Olpidiopsis* Cornu emend. A. Fisch. 1880. Since the incorporation of the type concept into the rules, such a pair of proposals is out of order: there is only one *Olpidiopsis* Cornu (which can be retained or rejected, but not both simultaneously), the *Olpidiopsis* which retains the type of the genus, in this case clearly *O. Saprolegniae* (A. Braun) Cornu. Here again the proposal is extraordinary — to typify the retained *Olpidiopsis* by *O. Saprolegniae* Cornu em. A. Fisch. pp. 34, 38, and the retained *Pseudolpidium* by *P. Saprolegniae* A. Fisch. p. 35. As noted in the discussion of *Olpidiopsis*, these are obligate synonyms: *Pseudolpidium Saprolegniae* (A. Braun) Fisch. ≡ *Chytridium Saprolegniae* A. Braun ≡ *Olpidiopsis Saprolegniae* (A. Braun) Cornu. Because of this synonymy it is greatly preferable to designate *Pseudolpidium fusiforme* (Cornu) A. Fisch., which according to Fischer likewise shows the generic character, as the type of the genus.

In any case, the proposal to conserve *Pseudolpidium* against Fischer's 1880 idea of *Olipidiopsis* is wholly unnecessary; Fischer's 1880 idea has no standing unless it refers to Cornu's genus, and that Fischer himself denied in 1892. One need not conserve a validly published name against

an earlier misapplication. Finally, if McLarty (Torrey Bot. Cl. Bul. **68**: 48 et seq. 1941) is correct, the two generic names apply to but one genus in any case. The proposal should be rejected.

PUCCINIA PERS. vs. PUCCINIA (MICH.) ADANS. and PUCCINIA WILLD. — IR pp. 126, 127; IRA p. 42.

The proposals seem to have been written with a singular disregard of the Rules. The Persoon genus is cited as "*Puccinia* Pers. Neues Mag. Bot. Römer I. (1794) 118." Since the starting-point for nomenclature of the rusts is Persoon's Synopsis, 1801, "*Puccinia* Pers. . . . 1794" is nonexistent. On the other hand, *Puccinia* Pers., Syn. Meth. Fung. 225. 1801 — the *Puccinia* with which mycologists are concerned — stands without conservation against all synonyms. The Adanson and Willdenow names proposed as nomina rejicienda were published in, respectively, 1763 and 1787, and are therefore rejected by the normal operation of the Rules.

It is possible that these proposals, and others as incomprehensible, were advanced as *proposita eventualia*, to be considered if the adoption of Rules different from those now in operation should invalidate genera now valid. Until the achievement of that eventuality, the proposal should be rejected.

RAMARIA (FR.) BON. vs. CLADARIA RITGEN — Donk 1941 pp. 158, 177; Doty p. 128.

Ramaria Holmsk. ex Gray, Nat. Arr. **1**: 655, antedates *Cladaria* 1831 and is valid without conservation. *Ramaria* (Fr.) Bon., a concept of uncertain application, has never had any currency and consequently its conservation could not be said to "avoid disadvantageous changes in the nomenclature of genera" (Art. 21). The proposal should be rejected.

RAMULARIA FRES. vs. CYLINDROSPORA SCHROET. — IR p. 125; IRA p. 42; BMS 3 p. 292.

RAMULARIA SACC. vs. RAMULARIA UNGER EX CORDA — BMS 3 p. 292.

In BMS it is pointed out that most of the data on authors and places of publication in the IR proposal are wrong; these corrections need not be repeated here. As there amended, the proposal should read: "*Ramularia* Unger ex Corda — Type: *R. pusilla* — vs. *Cylindrospora* Grev. ut '*Cylindrosporium*' ex Unger." Since there has been no expression of desire or need for the adoption of such a proposal, it is recommended that the first proposal here cited be rejected. The B.M.S. committee has also stated, "Schroeter . . . adopted '*Cylindrospora* Grev.' to replace *Ramularia* in the sense of Saccardo. As this excluded Greville's type species, Schroeter's use is now invalid." It is submitted that Saccardo's use of "*Ramularia* Ung." is equally invalid; and since Saccardo never published a genus *Ramularia* Sacc. (see notes under *Acrothecium*), there is no such genus; the second proposal must also be rejected.

RHABDOSPORA DUR. & MONT. vs. FILASPORA PREUSS — IR p. 125; IRA p. 42.

Rhabdospora as used by Durieu & Montagne was a section of *Septoria* — and a nomen nudum. It seems first to have been published by Saccardo, Michelia **2**: 6. 1880, as an infrageneric group (rank not specified) within *Septoria*; Saccardo gave a description and an example, "*S. pleosporioides* Sacc." It seems to have been employed for the first time as a generic name, again by Saccardo, in Syll. Fung. **3**: 578. 1884. It would be permissible to cite the genus as *Rhabdospora* (Sacc.) Sacc. 1884; since in both places Saccardo attributed it to "Mont.", it would better express his intention to write "(Dur. & Mont. ex Sacc.) Sacc.", indicating that Saccardo had adopted an earlier name applied to a group of fungi not described but whose members were known. In that event the two species most eligible as type are *R. Oleandri* (Dur. & Mont.) and *R. peregrina* (Dur. & Mont.), which were included both in the earlier undescribed section and in Saccardo's genus. If the genus be attributed to Saccardo alone, there are eighty-six possible choices, of which *R. ramealis*, listed in IR, seems to have no better claim than many others.

In either case, Saccardo's nomenclatorial procedure is hard to justify; for he adopted an undescribed infrageneric name in place of Preuss's adequately described genus *Filaspora*, retaining three of Preuss's four species (against two out of a dozen of Durieu & Montagne's) and reducing them to synonymy under names which he himself published; Saccardo even substituted his own specific epithet "*Preussii*" for one of Preuss's. There seem, however, to be no obstacles to conservation of Saccardo's name if that seems desirable to students of such fungi.

RHIPIDIUM CORNU vs. RHIPIDIUM AUCT. — Lütjeharms; Donk 1941 p. 192.

The exact definition of "orthographic variant" being as yet not established, it is not certain that all the nomina rejicienda proposed are actually homonyms. But *Rhipidium* Wallr. (for which see notes under *Panus*, and Singer & Smith p. 255) undoubtedly is, and since conservation of *Rhipidium* Cornu automatically rejects all names subsequently judged to be homonyms, the proposal "*Rhipidium* Cornu vs. *Rhipidium* Wallr." will suffice. The genus is perhaps of sufficient size and interest to make conservation appropriate, the more so that it appears to have but the one name. It is recommended that the proposal be adopted.

RHODOPHYLLUS QUÉL. vs. ACURTIS FR., ENTOLOMA (FR.) QUÉL., LEPTONIA (FR.) QUÉL., NOLANEA (FR.) QUÉL., ECCILIA (FR.) QUÉL., and CLAUDOPUS (FR.) GILL. — Singer p. 50; Singer & Smith 1946 pp. 261, 278, 295, 1948 p. 629.

Rhodophyllus is one of the most extravagantly superfluous names yet published for fungi, perhaps exceeding in that respect even *Sordaria*. Like that name (q.v.), it is several times over an illegitimate name under Art. 60 (1). In erecting *Rhodophyllus* in 1886 Quélet divided its species among

five sections or subgenera, four being Friesian groups which he himself had elevated to the rank of genera in 1872, and the fifth, one so elevated in 1876. Since all of the proposed nomina rejicienda except *Acurtis* are better established, and more familiar to the majority of mycologists, than *Rhodophyllus*, it appears doubtful that the proposal would produce "fixity of names" (Art. 4) or "avoid disadvantageous changes" (Art. 21). *Rhodophyllus* is one of two generic names proposed by the authors for "conditional conservation"; the legitimacy of such conservation is argued on an earlier page of these notes under *Marasmius*, and the discussion need not be repeated here. The present proposal is fundamentally different. There *Marasmius* may be (and is, by the author of the proposal) considered generically distinct from the alternative genus, and the conserved name displaces the other only when the two are held to be taxonomic synonyms. Here *Rhodophyllus* is composed exclusively of five infrageneric groups synonymous and cotypic with five Friesian groups already raised to the rank of genera; *Rhodophyllus* must then be nomenclatorially synonymous with one of those genera. By the authors of the proposal it is in fact made synonymous with *Entoloma* (1946 p. 278). If the conservation were approved, *Rhodophyllus* would displace the other nomina rejicienda only when they were held to be taxonomic synonyms of the conserved name; but being an absolute synonym of *Entoloma* (same type) *Rhodophyllus* would in all cases displace that name. This is not what is wanted, either by the authors of the proposal or by anyone else. One vote is here cast against the proposal; it is highly desirable that other mycologists, especially those who, like Singer and Smith, are students of the agarics, should consider it further.

Acurtis Fr. is the only one of the proposed nomina rejicienda that is not in current use. The authors question whether it can be rejected under Art. 65 as "based on a monstrosity." It appears that the abortive carpophores of *Clitopilus abortivus* on which apparently the name *Acurtis* was founded do not bear basidia; if that be the case, *Acurtis* must be rejected under Art. 57 as based on an imperfect state (cf. Rogers 1948). What seems to be a part of the type collection of *Clavaria gigantea* Schw., Naturf. Ges. Leipzig Schr. **1**: 113. 1822, the genotype of *ACurtis* [!] Fr., Summ. Veg. Scand. 337. 1849, now in the Farlow Herbarium, has no basidia nor basidiospores; and unless contrary evidence appears, that may be taken to settle the case of *Acurtis*.

Entoloma (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5:** 116 and in Champ. Jura Vosges 83 (see note under *Flammula*); *Leptonia* on pp. 121 and 88 of the respective works; *Nolanea* on pp. 122 and 89; *Eccilia* on pp. 123 and 90.

SCOLECOTRICHUM KUNZE & SCHMIDT EX FR. vs. ——? — Ainsworth & Bisby 1943 p. 269, 1945 p. 287.

Von Höhnel (Centralbl. Bakt. 2 Abt. **60**: 6. 1923) states that the type of *Scolectotrichum* Kunze, Myc. Hefte **1**: 10. 1817 (*S. virescens* Kunze)

is doubtfully a fungus and has never been recognized; Saccardo (Syll. Fung. **4**: 35) states in quotes that it is a "dubia species." *Scolectrichum* Kunze & Schmidt ex Link, Linn. Sp. Pl. ed. 5 (Willd.) **6** (**1**): 35. 1824 and *Scolecotrichum* Kunze ex Fr., Syst. Mycol. **3**: 449. 1832, still contain but the single species. Link saw dried material, but his discussion adds nothing to the original descriptions; Fries had only the descriptions and figures. There can be no question that the type is *S. virescens*, nor any evasion of the conclusion that both that binomial and *Scolecotrichum* are nomina dubia, rejected under Art. 63. It is recommended that the proposal be rejected.

SCOPULARIA PREUSS, Linnaea **24**: 133. 1851 — Type: *S. venusta* Preuss, l.c. p. 134 — and SCOPULARIA LINDL., Edwards Bot. Reg. **20**: pl. 1701. 1834.

According to Goidanich (Ann. Mycol. **31:** 134–138. 1933) *Scopularia* Preuss includes three species, of which the type species is unknown except for the original descriptions; it has (he states) as a later synonym *Leptographium* Lagerb. & Melin. If that synonymy be rejected, Preuss's genus is reduced to one known species, *S. scopula* Goid. No proposal for conservation has been published, and none is offered here; the only intent is to note the earlier homonym. Lindley's name is listed among the rejicienda in Kew Bul. Mis. Inf. **1940**: 96, where it is cited as published "in Edw. Bot. Reg. XX (1834) sub t. 1701." It is there, however, a nomen nudum and probably a nomen eventuale; but Lindley later published it in Gen. Sp. Orchid. Pl. 303. 1835.

SECOTIUM G. KUNZE vs. ENDOPTYCHUM CZERN. — Ainsworth & Bisby 1943 pp. 101, 270.

The authors cited write (p. 270) "Conservation against *Endoptychum* may be necessary." In the second edition of their *Dictionary* mention of conservation is dropped. There are two reasons, either sufficient, why conservation should not be attempted: (1) *Secotium* antedates *Endoptychum*, by five years; and (2) the two names are coming to be considered to apply to different genera (cf. Kambly & Lee, Univ. Iowa Studies N.H. **17**: 126. 1936; confirmed by Dr. S. M. Zeller in litt.). The proposal, if it is one, should be rejected.

SEPTOBASIDIUM PAT. vs. GLENOSPORA BERK. & DESM. and GAUSAPIA FR. — Boedijn & Steinmann p. 171; Couch pp. 67–68; Donk 1941 pp. 158, 178.

Septobasidium is a name universally employed for a large and well-known genus; *Gausapia* has always been obscure; and *Glenospora*, besides being little known as a name for the fungi to which it is applicable, has by the eager ineptitude of non-mycologists been given considerable currency as a name for a pathogen on human beings. There is every reason then for adopting the present proposal.

Donk has proposed (l.c.) that *Thelephora pedicellata* Schw. sensu Pat.

(*S. Couchi* Donk) be accepted as the type. In this he has overlooked the fact that, as Martin (1944 p. 71) has pointed out, Patouillard effectively designated his own type. *Septobasidium* was established for two species: *S. pedicellatum* (Schw.) Pat. and *S. velutinum* Pat. Later in the same year, in a further discussion, Patouillard divided his genus into two groups: *Typicae*, with *S. velutinum*, and *Podobasidium*, with *S. pedicellatum*. The motion for conservation should therefore read *Septobasidium* Pat. . . . — Type: *S. velutinum* Pat. — vs. *Gausapia* Fr. . . . and *Glenospora* Berk. & Desm. . . . In such a form it is recommended for adoption.

SEPTORIA SACC. vs. SEPTORIA FR. — see *Phleospora*, on an earlier page.

SORDARIA CES. & NOT. vs. SCHIZOTHECIUM CORDA, PLEURAGE FR., and PODOSPORA CES. — IR pp. 122, 127; IRA p. 42; Cain pp. 5–10; Cain & Groves pp. 486–487.

If ever a name was published which should not have been, *Sordaria* is such a name. *Schizothecium* Corda, Icon. Fung. **2:** 29. 1838, was monotypic on publication; its type species is listed as a possible synonym of *Sordaria fimiseda* by Cesati & De Notaris. (In Bot. Zeit. **14**: 429, and in the place of publication of *Podospora*, it is stated that *Schizothecium* "observed in old specimens [was] hence imperfectly founded"; but a genus is not invalidated on such grounds. Fries, Summ. Veg. Scand. 418, alleges the existence of two earlier homonyms. But the first is not strictly a homonym, and the second was before 1841 a nomen nudum). *Enterobotryum* Preuss, Linnaea **25**: 733. 1852 is monotypic; Cesati & De Notaris list it as a synonym of *Sordaria*, and its type as *S. conicum* (Preuss). *Podospora* Ces. ex Rabenh., Klotzsch Herb. Viv. Mycol. ed. nova. Cent. **3**: 258. 1856; Bot. Zeit. **14**: 429. 1856, was likewise monotypic: it was based on *P. fimicola* (Corda) Ces. and is an obligate synonym of *Schizothecium*. Cesati & De Notaris list it as a synonym of their *Sordaria fimiseda*. *Malinvernia* Rabenh., Hedw. **1**: 116. pl. 15, fig. 4, 1857 was likewise monotypic; the name was given to *Sphaeria anserina* Ces. in litt. At first glance it would appear to be a nomen nudum; but it is undoubtedly "validated" (Art. 43) by "a plate with analyses." Cesati & De Notaris do not list the species in their original publication of *Sordaria*, but do cite *Malinvernia* as a synonym of their genus. *Pleurage*, sometimes used for *Sordaria*, is cited as having been published by Fries in Summ. Veg. Scand. 418. 1849. There, however, it is a nomen provisorium, "proposed . . . in anticipation of the eventual acceptance of the group . . . [and] not validly published" (Art. 37; Zesde Int. Bot. Congr. Amsterdam Proc. **1**: 365. 1936; IRB p. 76; IRA pp. 13, 14). For Fries used it only in the following manner: "*Schizothecium. Cord.* . . . Genus mihi ignotum . . . . Si genus recipiatur, nomen mutandum . . . et aptius dicatur *Pleurage.*" *Pleurage* seems not to have been used again until it was taken up by Otto Kunze; it is of course an obligate synonym of *Schizothecium* and *Podospora*. It is not an obligate synonym of *Sordaria* unless to the latter genus is assigned *S. fimiseda* Ces. & Not. as a lectotype; Griffiths (Torr. Bot. Cl. Mem. **11**: 55. 1901)

and other authors treated *Pleurage* as distinct. Having the names *Schizothecium*, *Enterobotryum*, *Podospora*, *Malinvernia*, and perhaps even *Pleurage* to choose from, the third a Cesati name and the fourth based on Cesati material, Cesati & De Notaris elected to publish still another name, *Sordaria* (Soc. Crittog. Ital. Comm. **1**: 255. 1863) for the group. Their name is superfluous several times over — that is, "the group to which it was applied, as circumscribed by its author[s], included the type[s] of [several] name[s] which the author[s] ought to have adopted" (Art. 60 (1); Zesde Int. Bot. Congr. Amsterdam Proc. **1**: 354 (Art. B60). 1936; IRB p. 90; IRA p. 22).

Since *Sordaria* has been proposed for conservation, the question of its type is important. Of the twelve species enumerated by Cesati & De Notaris some are clearly less eligible than others. Some of the species were certainly seen by the authors; two, *S. conica* and *S. fimicola*, were merely accepted from published descriptions, and should undoubtedly not be considered. Griffiths (Torr. Bot. Cl. Mem. **11**: 40) writes that *S. fimicola* (Rob.) "remains to represent our present concept of the genus," all others having been transferred elsewhere or dropped, and thereby implies that it should be the lectotype; and Cain (p. 9) singles out the same species; but as already noted, that is one of the two species that the authors of the genus knew only "ex Diagnosi," against ten they had examined. Griffiths & Seaver (N. Am. Fl. **3**: 65. 1910) later made the same species the type of the genus *Fimetaria*. Of the species eligible as lectotype a good case can be made for the selection of *Sphaeria sordaria* Fr., the evident source of the generic name, or for *S. fimeti*, *S. coprophila*, *S. fimiseda* (cf. Cain & Groves), and *S. pauciseta*, all of which are listed as having been illustrated by Cesati. Within that list of five should be found the entity which the authors had chiefly in mind in describing the genus.

No further recommendation is here offered; the final selection of the type, and the decision whether conservation is desirable, should be left to students of the group.

SPEGAZZINULA SACC. vs. DUBITATIO SPEG. — IR p. 121; IRA p. 42; BMS 3 p. 282.

This is one more case where, Saccardo having chosen to be a law unto himself, it is proposed by conservation to make him a law unto all generations. The law on the point is contained in Art. 59; and even if there were no such rule, it would be hard to defend *Spegazzinula*, on grounds either of euphony or expressiveness, against *Dubitatio*. Botany has become impoverished indeed if the "serious motives" (Art. 17) supposed to underlie the naming of plants leave no room for a jest. The B.M.S. committee finds two binomials in Saccardo's genus and one in Spegazzini's. Their recommendation for rejection of the proposal is here seconded.

SPHAERELLA Ces. & Not. 1863 vs. MYCOSPHAERELLA Johans. 1884 — IR p. 122; IRA p. 42; BMS 1 p. 220; Bisby p. 102.

The British proposal differs from that published in the Rules chiefly in listing the name to be conserved as "*Sphaerella* (Fr.) Rabenh. (1856)," Herb. viv. mycol. ed. 2, no. 264. The printed Rabenhorst label cited reads as follows: "264. *Sphaerella punctiformis* (Pers.) Rabenh. Mspt. var. *perexigua* Desm. In Quercus foliis passim." By the British committee "it is submitted that this transfer raised the subgenus *Sphaerella* Fr. to generic rank." It is here submitted, on the contrary, that so far as the Rabenhorst label is concerned the subgenus *Sphaerella* Fr. is not involved in any way (it is not cited even obliquely), and the generic name *Sphaerella* and specific name *Sphaerella punctiformis* are there nomina nuda. Alternatively, one must ask under what Article — 37, 42, 43, or 44 — they were validly published.

As noted in the British proposal, *Sphaerella* Ces. & Not. as published in 1863 is quite independent of Fries's subgenus; as a matter of fact it does not include (at least, not by name) any species listed by Fries. Neither does it include *S. Asteroma* (Fr.) Karst., proposed in IR as the type. There are twenty-five species eligible as the lectotype of *Sphaerella* Ces. & Not.; but *S. Asteroma* is not one of them. Nor is that species a possible lectotype for *Sphaeria* subg. *Sphaerella* Fr. 1849 or *Sphaerella* (Fr.) Fuckel, Symb. Mycol. 99 [1870] (not 1869!). *Sphaerella punctiformis* (Pers. ex Fr.) Fuckel, proposed by the British committee as the lectotype, is a member of both Fries's subgenus and Fuckel's genus, and could be adopted — but only by conserving *Sphaerella* (Fr.) Fuckel against *Sphaerella* Ces. & Not.

On the showing of the British committee *Carlia Oxalidis* Rabenh., the monotype of *Carlia* Rabenh., is a nomen dubium, and the name *Carlia* therefore is not an alternative here.

To return to the original proposal, which was to conserve *Sphaerella* against *Mycosphaerella*: Except for Saccardo, who persisted in the indefensible use of *Sphaerella* as he did in so many other nomenclatorial and taxonomic absurdities, the greater part of recent and current usage favors *Mycosphaerella* (cf. BMS 1 p. 221, Miller 1941 p. 79, and Bisby). Since that name has the additional advantage of being valid, it should not be rejected merely to validate Saccardo's aberrations.

As indicated by a footnote in the Rules, the real intent of the motion is to conserve *Sphaerella* Ces. & Not. 1863 against *Sphaerella* Sommerf. 1824. The latter name is in current and general use for a genus of algae, and has been for so long a time that even if the fungus *Sphaerella* were not rejected as a later homonym it should be suppressed as "a permanent source of confusion or error" under Art. 62.

It is recommended that the proposal be rejected.

SPHAEROPSIS LÉV. vs. MACROPLODIA WESTEND. — IR p. 125; IRA p. 42; BMS 2 p. 287.

SPHAEROPSIS SACC. vs. SPHAEROPSIS LÉV. — BMS 2 p. 287.

Sphaeropsis Lév is a monotypic genus whose type species, on the authority of the B.M.S. committee, is an *Amphisphaeria*, an ascomycete; it therefore does not conflict with *Macroplodia*, a name given to a genus of fungi imperfecti. The first proposal should then be rejected.

Saccardo is said to have "recharacterized" *Sphaeropsis* in Michelia **2**: 105. He did not there publish a genus *Sphaeropsis*, however, but merely noted "Genus 'Sphaeropsis' hucusque vage definitum, limitetur ad species *Diplodiae* stylosporis fuscis jugiter continuis." In Syll. Fung. **3**: 291 he described "*Sphaeropsis* Lév. . . . emend., Sacc. Mich. II. p. 115." This is not publication of a new name, but misapplication of an old one (see discussion under *Acrothecium*). There is no genus *Sphaeropsis* Sacc. The second proposal must therefore be rejected also. On an earlier page, under *Amphisphaeria*, it is recommended that *Sphaeropsis* be rejected as a nomen ambiguum.

STAGONOSPORA (SACC.) SACC. vs. HENDERSONIA BERK. and PSILOTHECIUM FUCKEL — IR p. 125; IRA p. 42; BMS 2 p. 290.

In BMS are indicated errors appearing in IR, notably that the lectotype earlier proposed has nothing to recommend it. As modified by the B.M.S. committee the proposal seems both in order and useful; their recommendation for adoption is accordingly seconded. See notes under *Hendersonia*.

STEREUM PERS. ex FR. 1835 vs. AURICULARIA BULL. ex FR. 1825 and STEREUM FR. 1825. — Donk 1941 pp. 158, 178.

Stereum Pers. ex Gray, Nat. Arr. **1**: 652, is valid without conservation (see notes under *Hymenochaete*); and if it be typified by *S. hirsutum*, as is allowable, preserves the name in the application sought by the proposal, which is therefore unnecessary and should be rejected.

If there be no earlier valid designation of the type of *Stereum* Pers. ex Gray, *Stereum hirsutum* is hereby so designated.

STIGMATEA FR. vs. ASCOSPORA FR. — IR p. 122; IRA p. 43; Bisby p. 103.

Ascospora Fr. was published with the designated type *A. Aegipodii* (Pers. sub *Sphaeria* ex Fr., Syst. Mycol. **2**: 526. 1823.). The name *Stigmatea* is first found in Summ. Veg. Scand. 421, where it was published with the references "*Fl. Scan. Cord. IV f. 119.*" This seems separable (although no separation appears, l.c.) into a reference to Fries's Fl. Scan. and one to Corda's Icones. In Fl. Scan. 347. 1835 Fries published *Stigmea*; clearly *Stigmatea* is merely an improved spelling of the earlier generic name; "the original spelling . . . must be retained" (Art. 70). (For the comparable case of *Dermea* and *Dermatea*, see Groves, Mycologia **38**: 352–355. 1946). The complete Corda reference is Icones Fung. **4**: 41. pl. 8, fig. 119. 1840; the species is *Sphaeria Armeriae*, which Saccardo (Syll. **2**: 247)

treats as a form of *Pleospora herbarum*. Fries listed no species in 1835, and one must therefore look to the 1849 publication for the type of the genus. *Sphaeria Armeriae* is the logical choice, since Fries cites it as a basis for the genus; but it is not one of the list (said by Fries to be incomplete) of enumerated species. The one definite character ascribed to the genus in 1849 is "asci subtetraspori," and therefore an eight-spored species should not be designated as the lectotype. (The lectotype proposed in IR, *S. Robertiani*, is said by Saccardo to be octosporous).

The type of *Ascospora* has been transferred to *Stigmatea* as *S. Aegipodii* Oudem., and it may be that the genera conflict. But Bisby notes (without reference) that "*Ascospora* Fr. is said to be a nomen confusum." If that be true, *Ascospora* is automatically rejected, and *Stigmea* (rather than the variant spelling) will stand without conservation. Someone acquainted with the group should determine 1) which of the six species (or seven, including *Sph. Armeriae*) listed in 1849 under *Stigmatea* is the best lectotype of *Stigmea*, 2) whether *Sphaeria Aegipodii* Pers. ex Fr. is congeneric with that lectotype or is a nomen confusum, and 3) if it is congeneric, whether it is important to conserve *Stigmea*. No recommendation is offered here.

TEICHOSPORA FUCKEL vs. STRICKERIA KÖRB. and SPHAERIA FR. — IR p. 122; IRA p. 43; BMS 3 p. 285.

From the investigations carried out by the B.M.S. committee it appears that both *Teichospora* and *Strickeria* have been and are widely used, and that if there is any advantage it lies with the earlier name. Their recommendation that the proposal to conserve *Teichospora* be rejected is therefore seconded here.

The exact action implied by the recommendation in BMS "that *Sphaeria* Fr. emend. Ces. & de Not. be not restored" seems far from clear. However much or little Cesati and De Notaris have to do with it, the genus *Sphaeria* Haller ex Fr., Syst. Mycol. **2**: 319. 1823 (or Haller ex Gray, Nat. Arr. **1**: 526. 1821; or [Pers. ex] Hooker, Fl. Scot. **2**: 4. 1821) is one of the great classical genera of fungi, and not only "must be retained, or . . . must be re-established" (Art. 51), but should be, along with *Agaricus* (q.v.), *Clavaria*, *Thelephora*, *Boletus*, and others of comparable importance and venerability. The typification of this difficult genus may well be left to its special students. It is recommended that if *Teichospora* is conserved *Sphaeria* Fr. be deleted from the nomina rejicienda.

THYRSIDIUM MONT. EX DUR., Expl. Sci. Algérie Bot. **1**: 324. 1846–9 vs. CHEIROSPORA MONT. & FR., Syst. Orb. Veg. 365. 1825 — Ainsworth & Bisby 1943 p. 298, 1945 p. 318.

The name *Cheirospora* Mont. & Fr. was published by Fries in the addenda to the S.O.V., without mention of component species. Like other genera proposed in that work, it was discarded in vol. 3 of the Systema (index, p. 70); it evidently was based on material described in Syst. Mycol.

3:[484]. 1832 as *Stilbospora Cheirospora* — attributed to Fries alone in the index.

The name *Thyrsidium* was first mentioned by Montagne, who seems never to have heard of the genus *Cheirospora* published in his name, in Ann. Sci. Nat. Bot. ii **6**: 338. 1836. There he gave a brief description of *Stilbospora botryospora* Mont., under which he listed (apparently as a dubious synonym) "*S. cheirospora* Fr. Syst. Myc. 3. p. 484. An genus novum stilbosporeum sporidiis pedicellatis distinctum?" In the discussion which follows Montagne said ". . . on pourrait croire avoir sous les yeux des individus du *S. cheirospora* de Fries, si l'auteur ne distait formellement que les sporidies ne sont jamais cloisonnées." "Never" is strong language, especially when Fries did not so much as say "hardly ever." Fries wrote (l.c.), "Sporidia praecedentis [*Stilb. asterospermae*] similia. . . . Singulas non septatas vidi." Whatever one makes of Fries's grammar here, he seems to say that he "now and then saw spores that were not septate." On Montagne's showing, then, his species is probably the same as Fries's. But the genus is another matter. Montagne stated that he had at first intended to describe for his species a new genus to which he would have given the name *Thyrsidium*, but that after reflection he had preferred to refer it to *Stilbospora*. That is evidently not publication.

Thyrsidium next appears in Expl. Sci. Algérie Bot. **1**: 324, 325. There Durieu, presumably with the collaboration of Montagne (cf. p. [i]) described *Thyrsidium* Mont. & *T. hederaecolum* (Not.) Dur., with the note "En même temps que M. le Dr Montagne publiait son *Stilbospora botryospora*, il faisait remarquer que sa plante pouvait être considérée comme le type d'un genre nouveau pour lequel il proposait le nom de *Thyrsidium*. Ce nom a donc incontestablement la priorité sur celui de *Hyperomyxa*, par lequel M. Corda a désigné postérieurement le même genre. . . ." Of course Montagne did no such thing; he wrote that after reflection he had changed his mind about publication of *Thyrsidium*.

Hyperomyxa Corda, Icon. Fung. **3**: 34. 1839 was published for the single species *H. Stilbosporoides*, which Durieu (l.c.) makes a synonym of "*Thyrsidium botryosporum* Montag." (thus incidentally first publishing the binomial for Montagne's type species). According to Montagne, then, *Cheirospora* Fr. and *Thyrsidium* Mont. are probably obligate synonyms; according to Durieu *Thyrsidium* and *Hyperomyxa* are obligate synonyms. Durieu further makes *Myriocephalum* Not., R. Accad. Sci. Torino Mem. Cl. Mat. Fis. ii **7**: 13. 1842; Corda Anleit. 192. 1842, a synonym, and incorporates its only species in *Thyrsidium*. Allowing the identity of all these generic names, *Cheirospora* 1825, *Hyperomyxa* 1839, *Myriocephalum* 1842, and *Thyrsidium* 1846–9, Saccardo adopts the latest of them, *Thyrsidium*, and fails to account in any way for *Stilbospora Cheirospora* (Syll. Fung. **3**: 761. 1884).

So much is paper-work. The nomenclatorial history of the genus is a series of bunglings worthy of the attention of C. G. Lloyd. Anyone who

desires to immortalize the latest will have to propose conservation of *Thyrsidium* against three other names. No recommendation is offered here.

TOMENTELLA PERS. ex PAT. vs. HYPOCHNUS FR. — IR p. 123; IRA p. 43; Donk 1933 p. 27; Rogers 1939 p. 305; BMS 1 pp. 225, 232.

TOMENTELLA PERS. ex PAT. vs. CALDESIELLA SACC. — Rogers 1939 p. 306; BMS 1 p. 232; Donk 1941 pp. 158, 179.

Since *Hypochnus* (q.v.) is strictly a genus of the Lichenes, it does not conflict with *Tomentella*, which therefore need not be conserved against it. The first proposal should be rejected.

Since *Tomentella* is a large and important genus and *Caldesiella* a small and little-known one, it appears to be agreed that the former name should be conserved.

TREMATOSTOMA (SACC.) SHEAR vs. CLYPEOTHECIUM PETR. — Shear 1942 p. 272.

The author of the proposal has first raised Saccardo's subgenus *Trematostoma* to generic rank and then, on the same page, proposed to conserve it against the twenty-year-old genus *Clypeothecium*. The only reason given is that *Trematostoma* "is the preferable name." According to Art. 59 "a name . . . must not be rejected . . . merely because . . . another is preferable." Moreover, since under the Rules conservation is provided for "to avoid disadvantageous changes in the nomenclature of genera" the proposal is quite out of order. If "fixity of names" is one of the two "essential points of nomenclature" (Art. 4), the proposal should be rejected.

TREMELLA PERS., Mycol. Eur. **1**: 98. 1822 — Type: *T. mesenterica* Pers., l.c. p. 99 — vs. TREMELLA DILL. ex GRAY, Nat. Arr. **1**: 593. 1821, and GYRARIA NEES ex GRAY, Nat. Arr. **1**: 593. 1821.

The type (monotype) of *Tremella* Gray is *T. recisa*, now universally placed in the genus *Exidia*. *Gyraria* in Gray's work contains twelve species; but since it is written "*Gyraria* Esenbeck," and its first species, *G. mesenterica*, is the only one of Nees von Esenbeck's species included, that should be its type. If these two genera of Gray's are not rejected, then, *Tremella* becomes the name of all exidias, and *Gyraria* the name of all species congeneric with *Gyraria* (= *Tremella*) *mesenterica*. It is therefore hereby proposed that *Tremella* Pers. be conserved, as indicated in the heading to this paragraph.

TREMELLODON (PERS.) FR. vs. HYDNOGLOEA CURREY — Donk 1941 p. 158, 179; Martin 1948 p. 117.

It should be noted that the generic name *Tremellodon*, 1874, is antedated not only by *Hydnogloea*, 1871, but also by *Pseudohydnum* Karst., Not. Faun. Fl. Fenn. **9**: 374. 1868 (num *Pseudohydnum* Rick, Ann. Mycol. **9**: 409. 1904?), which similarly is typified by *Hydnum gelatinosum*. There is no doubt, then, of their synonymy, nor that under the rules the well-known name *Tremellodon* must be superseded by the little-known *Pseu-*

dohydnum. The only question is whether conservation should be invoked on behalf of a monotypic genus of no particular importance. It is here recommended that it not be, and that the proposal be rejected. Although Donk recommends adoption of this proposal, he several times rejects similar ones on grounds of the small number of species involved. The same recommendation of rejection is offered elsewhere in this paper concerning *Cienkowskia*, *Cladoderris*, *Hypolyssus*, *Macowanites*, and *Mastomyces*. The decision finally adopted in one of these cases should govern all. If *Tremellodon* were to be conserved, *Pseudohydnum* should be included among the nomina rejicienda. Dr. G. W. Martin is using the name *Pseudohydnum* for the genus in question.

TRICHOLOMA QUÉL. vs. GYROPHILA QUÉL. and MONOMYCES EARLE — IR p. 124; IRA p. 43; BMS 1 p. 229; Donk 1941 pp. 158, 180; Singer & Smith 1946 pp. 259, 277, 293.

TROCHOLOMA (FR). QUÉL. vs. TRICHOLOMA BENTH. — BMS 1 p. 229; Donk 1941 pp. 158, 180.

The very strong case made out for the conservation of *Tricholoma* by the B.M.S. committee and by Donk is supported by Singer & Smith also. The arguments in BMS for the designation of *T. rutilans* as lectotype and by Donk for *T. imbricatum* seem to be somewhat more cogent than that of Singer & Smith, since *A. flavovirens*, nominated by the latter authors, was later removed by Fries from the section which he called *Genuina*. But on nomenclatorial grounds any of the three would be acceptable, and the choice should be left for agreement among agaricologists. Since *Gyrophila* and *Monomyces* are later than *Tricholoma*, the latter need not be conserved against them, but only against Bentham's earlier homonym. The first proposal should then be rejected and the second adopted.

Tricholoma (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5**: 76 (and should be so cited) and in Ch. Jura Vosges 38. See note under *Flammula*.

TRICHOSPORIUM FR. vs. COLLETOSPORIUM FR. and ALYTOSPORIUM FR. — IR p. 126; IRA p. 43.

The genus *Trichosporium* was first described by Fries in 1825 (Syst. Orb. Veg. 306), without enumeration of species. When he again referred to it, in Summ. Veg. Scand., he equated it to "Sporotrichum sect. 1. *S.M.*", noting "jam in S.O.V.O. a Botryti distinxi; at in S. M. cum Sporotricho tamquam peculiarem sectionem junxi." That "special section," marked by one asterisk, includes six species, *S. nigrum*, *S. geochroum*, *S. cinereo-virens*, *S. olivaceum*, *S. elaeochroum*, and *S.* ? *turbinatum* (Syst. Mycol. **3**: 416–417). All of these except the last (which Fries marked with an interrogation point), and *S. geochroum* Desm., form a part of *Trichosporium* as Fries first enumerated its species in Summ. Veg. Scand.; and even the Desmazières species may be what is there listed as "*S. geotrichum* (Desmaz.)." From the four (or perhaps five) species forming a part of both

the "special section" and the genus the type of the latter should be chosen. The species proposed in IR as lectotype, *T. murinum* (Fr.) Sacc., formed a part neither of the section cited nor of the genus *Trichosporium* as Fries conceived it, and therefore is not eligible.

Colletosporium Lk. in Linn. Sp. Pl. 5 ed. (Willd.) **6**(**1**): 25. 1824 was published for two species, *C. umbrinum* and *C. atrum*. The "Fr. ex Link" citation in IR is nonsense; what appears in Fries, in the place cited in IR, is "*Mycelia saepe luxuriantia Hymenomycetum*: . . . Celletosporium Link? mihi non certe notum, sed adsunt Thelephorae status quibus convenit character." Fries did describe the genus, apparently from Link's account, in S.O.V. 304. Link's genus was again described, with its two species, in Wallroth, Fl. Crypt. Germ. **2**: 316. 1833. Whether or not genera of hyphomycetes were validly published before 1832, then, *Colletosporium* Lk. (or Lk. ex Wallr.) has priority.

Alytosporium Lk. in Linn. Sp. Pl. 5 ed. (Willd.) **6**(**1**): 23. 1824 included five species, *A. fuscum* (Pers.), *A. fulvum* (Lk.), *A. croceum* (Kunze), *A. psittacinum* (Lk.), and *A. murinum* (Lk.). Of these the first is a synonym of *Tomentella fusca*; on the ground that that species has already been removed from *Alytosporium*, and that its employment as the type of Link's genus would create an unnecessary and inconvenient synonymy with *Tomentella*, *A. fuscum* should be excluded from consideration as a lectotype. There appears to be no published record of the recent examination of Persoonian material of *fuscum*, but the general opinion is that its assignment to *Tomentella* is probably correct. Saccardo has it both ways: in Syll. Fung. **4**: 239 he makes *Corticium fuscum* Pers. and *Thelephora vinosa* Pers. synonyms of *Trichosporium fuscum* (Pers.) Sacc.; in Syll. Fung. **6**: 613 he lists them both under *Corticium fuscum* — which is absurd. If, as here recommended, *A. fuscum* (Fr.) Link is held not to be the type of Link's genus, one connection between *Trichosporium* Fr. and *Alytosporium* Lk. is broken. Of Link's remaining four species one other was transferred by Saccardo to *Trichosporium* — *A. murinum* (Lk. sub *Sporotrich.*) Lk. In the 1824 work under discussion Link cites his *Sporotrichium murinum* twice — once on p. 24, where reference is made to publication in Mag. Ges. Naturf. Fr. Berlin **7**: 35. 1815, and where *S. murinum* is transferred to *Alytosporium*; and once on p. 6, where reference is made to publication in Jahrb. Gewächsk. **1**: 173. 1820, and where *S. murinum* is described as a sporotrichum. It is submitted that *S. murinum* Lk. is a nomen ambiguum (as well as a nomen dubium). If it be considered the type of *Alytosporium*, that name is likewise a nomen ambiguum et dubium, and being therefore rejected, does not interfere with the use of the name *Trichosporium*. If it is not the type of *Alytosporium*, that genus and *Trichosporium* need not conflict.

So much is paper-work. Whether there is any particular advantage to be gained from the conservation of *Trichosporium* (with one of the eligible species as type) against *Colletosporium* is a taxonomic judgment, and is left to students of hyphomycetes.

TUBERCULARIA FR. EX TODE VS. KNYARIA KUNTZE — IR p. 126; IRA p. 43; BMS 1 p. 231.

TUBERCULARIA TODE EX FR. VS. TUBERCULARIA WIGGERS — BMS 1 p. 231.

Tubercularia Tode was described in Gray, Nat. Arr. **1**: 547. 1821; in Hooker, Fl. Scot. **2**: 9. 1821 (with implied attribution to Persoon; cf. p. [3], footnote b); in Link, Linn. Sp. Pl. 5 ed. (Willd.)**6(2)**: 99. 1825; in Fries, Syst. Orb. Veg. 173. 1825; in Sprengel, Linn. Syst. Veg. 16 ed. **4(1)**: 564. 1827; in Duby, Bot. Gal. 2 ed. 879. 1830; and in Fries, Syst. Mycol. **3(2)**: 463. 1832. For determining the status of the genus it does not matter which is regarded as the valid publication: *T. vulgaris* is a principal (and usually the first) component of the genus, whoever published it, and should surely be the type. *Tubercularia* Wiggers has no currency whatever, and there appear to be no obstacles to the conservation of *Tubercularia* Tode ex [anyone], as recommended in BMS; a second to that recommendation is here offered. *Knyaria*, which is much later than *Tubercularia*, need not be formally rejected.

UROCYSTIS RAB. VS. TUBURCINIA FR. — BMS Pl. Path. Comm.; BMS 1 p. 223; Zundel et al.

Urocystis is said to have been published "in Klotzsch, Herb. viv. mycol. ed. 2, no. 393. (1856)." What appears to be this number in the New York Botanical Garden herbarium bears this label: "Rabenhorst. Herb. mycologicum. Ed. II. / 393. Urocystis occulta (Wallr.) Rabenh. / Schlecht. in bot. Zeit. 1852 p. 601. / Dresdae, ad Secales culmos vaginasque, haud infrequens. / NB. *Polycystis* (Lév.) est Algarum genus. L.R." This is evidently an obscure and oblique way to publish a genus; but it can be inferred 1) that Rabenhorst intended to publish as a new generic name the first element of the binomial with which he tagged his specimen; 2) that it was to be a substitute for *Polycystis* Lév., and that the author wished to say that *Polycystis* Lév. was *not* the homonymous genus of algae. If in addition it be allowed that the "(Lév.)" on Rabenhorst's label is a "reference" (Art. 37) to Léveillés "previously and effectively published description," *Urocystis* is there published. Otherwise, it must be cited as in some other place — perhaps as Rab. ex Fuckel, Symb. Mycol. 40. 1870. In either event its type should be *U. occulta*.

Polycystis Kütz. was published in Tab. Phycol. **1**: 7. 1846 (Jan.) in a note headed "Die Gattung Microcystis muss eigentlich in drei Gattungen gespalten werden, die ich vorläufig als Unterabtheilungen hier anführe, nämlich: . . . 3. Polycystis [Diagnosis follows.] Hierher: M. elabens. M. aeruginosa. M. ichthyoblabe." That is, *Polycystis* of the algae was described tentatively, and for an "Unterabtheilung" of *Microcystis*. Even if it was published earlier than *Polycystis* Lév., Ann. Sci. Nat. Bot. iii **5**: 269. 1846, which is very likely but not certain, it does not invalidate Léveillé's generic name, since if published at all it was published for a group of different rank. Léveillé's name is then valid; its type is *P. Pompholygodes* (Wallr.) (= *Urocystis Anemones*).

Since *Urocystis* is a name widely used for an important genus, its conservation, already recommended by the B.M.S. and American Phytopath. committees, is highly desirable. It is here recommended that the proposal be adopted in the following form:

Urocystis Rab. ex Fuckel, Symb. Mycol. 40. 1870. — Type: *Erysibe occulta* Wallr., Fl. Crypt. Germ. **2**: 212. 1833 — vs. *Polycystis* Lév., Ann. Sci. Nat. Bot. iii **5**: 269. 1846 and *Tuburcinia* Fr., Syst. Mycol. **3**: 439. 1832.

UROMYCES TUL. vs. NIGREDO ROUSSEL and CAEOMURUS GRAY.

UROMYCES (LINK) UNGER vs. NIGREDO ROUSSEL, CAEOMURUS (LINK) GRAY and PUCCINOLA MARCH. — IR pp. 122, 126, 127; IRA p. 43; BMS 1 p. 222.

As the BMS committee has pointed out, Link assigned to *Uromyces* the rank of subgenus (Ges. Naturf. Freunde Berlin Mag. **7**: 28. 1815); the committee has contended, however, that because Link made binomials with the subgeneric name plus an epithet "he used |his subgenera| as genera," and that "these binary combinations may be regarded as giving the date of the generic name." It is here submitted, on the other hand, that such illegitimate (Art. 27) binomials affect the status of the subgeneric name in no way, and merely bring about the rejection of both the binomials and the epithets as so used by Link (Art. 60). Although it is unsafe to be too confident in such matters, it appears that *Uromyces* was first published by Unger, as cited in IR. In that case it is antedated by the three genera there listed as nomina rejicienda.

There can be little disagreement with the BMS recommendation that the proposal for conservation of *Uromyces* be accepted; that recommendation is here seconded.

VENTURIA NOT. vs. ? — Bisby & Mason p. 172; Ainsworth & Bisby 1943 p. 316, 1945 p. 337.

VENTURIA NOT. — Type: C. inaequalis (Cke.) Wint. — vs. ENDOSTIGME SYD. — Shear 1948.

The case is both presented and refuted in a sentence in the place first cited: "The name *Venturia* should be conserved to continue its current use, which includes neither of the original species." H. Sydow (Ann. Mycol. **21**: 170–1. 1923) has a pungent account of the history of the genus, which should be read by all admirers of C. G. Lloyd and all faithful adherents of the Rules. Briefly, *Venturia* has two original species; both of these Saccardo transferred out of *Venturia*, and one he made the type of a new genus *Protoventuria*, citing *Venturia* as a synonym (Syll. Fung. **9**: 741. 1891); the name *Venturia* he retained for various fungi. Ainsworth & Bisby have "*Venturia* de Not. . . . Conservation necessary." One may agree that *Venturia* Not. should be retained without agreeing to conservation; for *Venturia* Not. stands without conservation.

Shear presents a more detailed discussion, in which he states that "the

name should be conserved and typified by a species representing the most general current usage"; "it is perhaps better to take *V. inaequalis* as the type." From his paper the second proposal listed above has been assembled. *Endostigme* is listed as the nomen rejiciendum because on Shear's showing it provides the valid generic name for the fungus commonly called *V. inaequalis*; it should, however, be noted that *Endostigme* was published (Ann. Mycol. **21**: 173) without designation of a type, and that while Shear treats *E. inaequalis* as the [lecto]type, Clements & Shear earlier (Gen. Fungi 268. 1931) designated *E. ditricha* (Fr.) as the type. Shear states also that "the specific epithet *cinerascens* is invalid for the apple scab fungus since *Sphaeria cinerascens* Fckl. is a later homonym of *Sphaeria cinerascens* Schw." This would be true if the Rules were reasonably straightforward and logical; but it appears that *Sphaerella cinerascens* Fuckel ex Rabenh., Fung. Eur. 845 and Hedwigia **4**: 158. 1865, is valid under Art. 69 ("an author may, if he wishes, adopt an epithet previously given to the group in an illegitimate combination"), and must furnish the epithet for the species.

It is recommended that both proposals be rejected, since both are unnecessary and the second is, as to typification, impossible. Although it is not here recommended, it would be possible under the present Art. 47 (for which see discussion under *Phoma*) to conserve *Venturia* Sacc., Syll. Fung. **1**: 586. 1882, non Not. — Type: *V. inaequalis* (Cooke) — vs. *Endostigme* Syd., thus commemorating and perpetuating one more of Saccardo's blunders that had best be forgotten.

VOLVARIA (FR.) QUÉL. vs. PSEUDOFARINACEUS EARLE — IR p. 124; IRA p. 43.

VOLVARIA (FR.) QUÉL. vs. VOLVARIA DC. — BMS 1 p. 230; Donk 1941 pp. 159, 181.

VOLVARIA (FR.) QUÉL. vs. VOLVARIOPSIS MURR. — Singer & Smith 1946 pp. 261, 293.

Since *Pseudofarinaceus* Earle is antedated by Kuntze's use of the same name for a different group, it must be rejected, even without conservation. Since both *Pseudofarinaceus* and *Volvariopsis* are antedated by *Volvaria* (Fr.) Quél., the latter need not be conserved against either. If conservation is to be authorized, it must be against *Volvaria* DC., a lichen genus. The B.M.S. committee and Donk have recommended conservation. Singer & Smith state that "since Murrill has made most of the important transfers to *Volvariopsis*, we are not convinced that the conservation of *Volvaria* is really vital." This principal, that conservation should not be recommended "merely because . . . [a name] is preferable or better known" (Art. 59), is entirely in accord with Art. 21, where conservation is provided "to avoid disadvantageous changes in the nomenclature of genera." Preclusive conservation, like that proposed for *Aleurodiscus*, *Calvatia*, *Clavaria*, *Conocybe*, *Tomentella*, *and Tremella*, is to be strongly recommended; where the alternative name and the binomials under it have al-

ready been published, conservation does not "avoid disadvantageous changes" and should be used very sparingly. It is certain that, even so, strong pressure will bring about the conservation of names less profitably retained, and it has not seemed possible to apply the principle in question in all the recommendations offered in these notes; but it should nevertheless be recognized and applied as often as possible. It is here recommended that the proposal be rejected.

Volvaria (Fr.) Quél. was published in Soc. Émul. Montbéliard Mém. ii **5**: 114 (and should be so cited) and in Ch. Jura Vosges 80. See note under *Flammula*.

II. NOMINA CONFUSA

The names of fungi here listed have been declared nomina confusa (cf. Art. 64). Specific names are given first, and afterwards generic names. For the former, references are given to the published evidence (except for *Corticium ferax*, not previously reported to be a nomen confusum); for the latter, the evidence must be the "confused" nature of the type species, and the list of specific names should be consulted. Citations for generic names are omitted when they are the same as those given for the genotypes. Four other generic names are given as nomina confusa in Ainsworth & Bisby 1943 — *Ascospora* Fr. on p. 22, *Dictyochora* Theiss. & Syd. on p. 87, *Monotospora* Corda on p. 187, and *Winterina* on p. 318; the pertinent evidence for these is not at hand. Many of the names have been taken from the Ainsworth & Bisby *Dictionary of the Fungi*.

For a proposed clarification of Art. 64, see Mycologia **40**: 635–637. 1948.

NOMINA SPECIFICA CONFUSA

CORTICIUM FERAX ELL. & EVERH., Am. Naturalist **31**: 339. 1896. The type consists of *Platygloea Peniophorae* Bourd. & Galz. and its substratum, a resupinate thelephoraceous fungus. The description embraces both components inseparably.

DARWINIELLA ANTARCTICA SPEG., Fung. Fueg. 105. 1887; Acad. Nac. Cienc. Cordoba Bol. **11**: 237. 1887. Cf. Petrak & Sydow, Ann. Mycol. **34**: 22. 1936.

EPHELIDIUM AURANTIORUM SPEG., Soc. Cient. Argentina An. **90**: 184. 1920. Cf. Petrak & Sydow, Ann. Mycol. **33**: 182. 1935.

GAMOSPORELLA HYSTERIOIDES SPEG., Soc. Cient. Argentina Anal. **26**: 63. 1888. Cf. Petrak & Sydow, Ann. Mycol. **33**: 160. 1935.

HETEROBASIDIUM CHLORASCENS MASS., Linn. Soc. Bot. Jour. **25**: 128. 1889. Cf. Lloyd, The Myths of Mycology, p. 15. 1917.

HYMENOBOLUS PARASITICUS ZUKAL, Österr. Bot. Zeits. **43**: 73. 1893. Syn.: *Hymenobolina parasitica* (Zukal) Zukal, Österr. Bot. Zeits. **43**: 133. 1893. Cf. Keissler, Naturhist. Mus. Wien Ann. **39**: 194. 1925; Santesson, Svensk Bot. Tidskr. **42**: 46. 1948.

HYPOLYSSUS UNDULATUS PERS., Mycol. Eur. **2**: 6. 1825; H. VENTRICOSUS Pers., l.c. p. 7. Cf. Fries, Linnaea **5**: 701. 1830; Kuntze, Rev. Gen. Pl. **3**(**2**): 487. 1898; Donk, Buitenzorg Bot. Gard. Bul. iii **17**: 195. 1941.

HYPORHAMMA RETICULATUM SENSU CORDA, Icones **6**: 13. 1854. Cf. Martin, Mycologia **40**: 125. 1948.

LANGLOISULA SPINOSA ELL. & EVERH., Jour. Mycol. **5**: 68. 1889. Cf. Rogers & Jackson, Farlowia **1**: 292. 1943.

LASIOPHOMA MAYDIS (SPEG.) SPEG., Physis **4**: 290. 1918. Syn.: *Chaetophoma Maydis* Speg., Soc. Cient. Argentina Anal. **22**: 190. 1886. Cf. Petrak & Sydow, Ann. Mycol. **34**: 33. 1936.

MUCIPORUS CORTICOLA JUEL, Bih. Sv. Vet.-Akad. Handl. **23**, Afd. 3 (12): 23. 1897; M. DELIQUESCENS Juel, l.c. p. 24. Cf. Juel, Ark. f. Bot. **14**(1): 1–9. 1916; Rogers, Bot. Gaz. **94**: 87. 1932; Donk, Buitenzorg Bot. Gard. Bul. iii **17**: 195. 1941.

PENIOPHORA ADMIRABILIS BURT, Mo. Bot. Gard. Ann. **12**: 304. [1926]. Cf. Rogers & Jackson, Farlowia **1**: 310. 1943.

PHYLLONOCHOETA SOLANI FRAG. & CIF., Repub. Domin. Estac. Agron. Moca Publ. ser. B. **8**: 43. 1927; R. Soc. Españ. Hist. Nat. Bol. **27**: 171. 1927 (not seen). Cf. Petrak, Ann. Mycol. **32**: 363. 1934.

PHYSALOSPORELLA CHILENSIS SPEG., La Plata Univ. Nac. Fac. Agron. Veter. Rev. **6**: 35. 1910. Cf. Petrak & Sydow, Ann. Mycol. **32**: 28. 1934.

THELEPHORA CALCEA PERS. * GLEBULOSA FR., El. Fung. **1**: 215. 1828. Syn.: *Corticum glebulosum* (Fr.) Bres., Fung. Trid. **2**: 61. 1898; *Peniophora glebulosa* (Fr.) Sacc. & Syd., Syll. Fung. **16**: 195. 1902; *Kneiffia glebulosa* (Fr.) Bres., Ann. Mycol. **1**: 104. 1903; *Peniophora cretacea* Bourd. & Galz., Hym. France 288. [1928]. Cf. Rogers & Jackson, Farlowia **1**: 284. 1943.

TRACHYTHYRIOLUM BRASILIANUM SPEG., Acad. Nac. Cienc. Cordoba Bol. **23**: 523. 1919. Cf. Petrak & Sydow, Ann. Mycol. **33**: 171. 1935.

TRICHOCHORA MARGINATA (THEISS.) THEISS. & SYD., Ann. Mycol. **13**: 289. 1915. Syn.: *Ophiodothis marginata* Theiss. Ann. Mycol. **10**: 10. 1912. Cf. Petrak, Ann. Mycol. **27**: 324. 1929.

NOMINA GENERICA CONFUSA

DARWINIELLA SPEG. Monotype: *D. antarctica* Speg.

EPHELIDIUM SPEG. Monotype: *E. aurantiorum* Speg.

GAMOSPORELLA SPEG. Monotype: *G. Hysterioides* Speg.

HETEROBASIDIUM MASS., Linn. Soc. Bot. Jour. **25**: 127. 1889. Monotype: *H. chlorascens* Mass.

HYMENOBOLINA ZUKAL. Monotype: *Hymenobolus parasiticus*.

HYPOLYSSUS PERS. Based on *H. undulatus* Pers. & *H. ventricosus* Pers. See discussion under *Hypolyssus* among the nom. cons. prop.

? HYPORHAMMA CORDA. The generic description is based on *H. recticulatum* sensu Corda; *H. reticulatum* sensu Corda is a nomen confusum. The nomenclatorial type of that species, *Trichia reticulata* Pers., is legitimate.

HYPOSPILA FR., Syst. Orb. Veg. 109. 1825. Listed by Ainsworth & Bisby 1943, p. 145, as a nomen confusum, with reference to BMS 3 p. 284. What the B.M.S. committee stated is that "the name . . . has been . . . confused" — i.e., that it is a nomen ambiguum. Petrak & Sydow (Ann. Mycol. **21**: 369. 1923) report that the type specimen of *Spiloma inustum* Ach., the species designated by Fries, l.c., as the type of *Hypospila*, shows "keine pflanzliche Bildung." *Hypospila* Fr. is then neither a nomen confusum nor a nomen ambiguum (Art. 62), but a nomen dubium. It is *Hypospila* sensu Auctt. which is ambiguous, and Auctt. var. who are confused.

LANGLOISULA ELL & EVERH. Monotype: *L. spinosa* Ell. & Everh.

LASIOPHOMA SPEG. Type: *L. Alliicola* (Tassi) Speg. — Petrak & Sydow in selecting a type for Spegazzini's genus excluded three of its five species from consideration, on the grounds that Spegazzini did not know them, and chose *L. Maydis* (q.v.) as lectotype. Since they regarded this as a nomen confusum, they stated that *Lasiophoma* "ist zu streichen." In publishing the genus, however, Spegazzini clearly designated *L. Alliicola* as the type; the genus stands or falls then with this species, which seems not to have been shown to be "confused," rather than with *L. Maydis*.

MELIOLINOPSIS BEELI, Bot. Jard. Bruxelles Bul. **7**: 101. 1920. — Ainsworth & Bisby 1943 p. 175 cite Stevens, Ann. Mycol. **26**: 285. 1928, as authority for the statement that this is a nomen confusum. Stevens's statement, l.c. p. 286, is "that many if not all of these 8-spored forms will . . . prove to be Pyrenomycetes parasitic upon Meliolas, and that the existing accounts confuse in description the Meliola host and the 8 spored parasite." But Stevens has already asserted that the generic type designated by Beeli lacks certain characters attributed to the genus, and has sought to exclude the type from the genus. Of course when such a discrepancy appears it is the description, not the type, which must be altered. Whether or not *Meliolinopsis* Beeli is a nomen confusum depends on the nature of *M. octospora* (Cke.), the type, upon which no testimony appears.

MUCIPORUS JUEL. Based on *M. corticola* Juel & *M. deliquescens* Juel. Often incorrectly cited as a synonym of *Tulasnella*, as in Ann. Mycol. **31**: 183 et seq.

PERICONIA TODE EX FR., Syst. Mycol. **3**(2): 307. 1832. Listed by Ainsworth & Bisby 1943 p. 216, 1945 p. 231 as a nomen confusum, with reference to Mason 1941. Although according to Mason (1941 p. 123) *Periconia* might be considered a nomen dubium, as defined by Art. 63, or a nomen ambiguum, as defined by Art. 62, there is no evidence presented that its characters "were derived from two or more entirely dis-

cordant elements . . . erroneously supposed to form part of the same individual"; it is therefore not a nomen confusum under Art. 64.

PHYSALOSPORELLA SPEG. Type: *P. chilensis* Speg.

SOPPITTIELLA MASS., Brit. Fung.-Fl. **1**: 106. 1892. — Listed by Ainsworth & Bisby 1943 p. 277 as a nomen confusum. It may well be that one or more of Massee's species consisted of two organisms mistakenly thought to be one; it is hard to account for some of the published characters on any other supposition. In Mycologia **36**: 78. 1944 *S. cristata* ([Pers.] ex Fr.) Mass. was designated as the lectotype; on that basis, *Soppittiella* would be not a nomen confusum, but a synonym of *Sebacina* Tul. Ainsworth & Bisby have so listed it in 1945 p. 295.

TRACHYTHYRIOLUM SPEG. Monotype: *T. brasilianum* Speg.

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SOME NEW SPECIES AND FORMS OF MARINE ALGAE FROM NEW ZEALAND

V. J. Chapman

Chlorophyceae: Cladophorales.

Wittrockiella salina sp. nov. (Fig. 1)

Planta minutissima, constante e brevibus ramosis filamentis simplices vel furcatis rhizoidis cellulis habentibus; cellulis latitudine et longitudine multum inter se differentibus, interdum paene quadratis, interdum 6-cies longioribus quam latioribus; cellula geniculata saepe praesente, plerumque materiem densiorem habente, pro more 150 x 198 μ diametro; chloroplaston reticulatum; sporangia ignota.

Plants microscopic, consisting of short, branched filaments with simple or forked rhizoidal cells; cells very variable in width and length, ranging from almost quadratic to six times as long as broad; chloroplast reticulate; many of the filaments have a "knee" cell usually with denser contents, av. dia. 150–198 μ. Reproduction unknown but zoospores or akinetes suspected to be produced from the "knee" cells.

In the shade of overhanging rocks near high watermark of spring tides, Stanmore Bay, Whangaparoa peninsula, New Zealand. Type specimen in herb. Auckland Institute and Museum.

This species is so minute that it is readily overlooked. At Stanmore Bay it was found entwined in the basal portion of Enteromorpha plants. The plant is extremely interesting because the only other species of this genus is from fresh water. There would seem little doubt, however, from the nature of the thallus, that its proper place is in the genus Wittrockiella. At Stanmore Bay a second collection was made after a lapse of two months and there was no evidence of great change. This is an important point because at first it was thought that the specimens might be young plants of some species of Cladophora or Cladophoropis.

Chlorophyceae: Ulotrichales.

Enteromorpha minima f. **fastigiata** form. nov. (Fig. 2)

Plantis minutis, ad 5 mm. altis, cristatis, ramis expandis, ad 200 μ latis, e basi attenuata orientibus; apice ramorum singulorum proliferationibus numerosis profuse gemmato; proliferationibus alibi raris, cellulis non in series dispositis, 4–6 μ diametro, 5–8 μ altis, parietibus crassis, chloroplaston cellulam complens; membrana 25–28 μ crassa a parte interiore 12 μ a parte exteriore 8 μ crassa.

Plants minute up to 5 mm. high, tufted, branches expanding up to 200 μ wide from an attenuated base; apex of each branch profusely beset with numerous proliferations, proliferations rare elsewhere; cells not arranged in rows, 4–6 μ dia. 5–8 μ high; walls thick, choroplast filling the cells; membrane 25–28 μ thick, walls 12 μ thick on the inside and 8 μ on the outside.

Growing in the shade of overhanging rocks near high watermark of

spring tides. Stanmore Bay, Whangaparoa peninsula, New Zealand. Type specimen in herb. Auckland Institute and Museum.

This is a very distinct form of a well-known and wide-spread species. It is most closely allied to var. *glacialis* but it differs in that the main proliferations are at the apices rather than at the bases of the branches: the membrane is also twice as thick as it is in var. *glacialis*. There is the possibility that this particular form is determined by the environmental conditions under which it grows. Immersion cannot be frequent, the light intensity must be reduced and there must be a considerable degree of exposure to desiccation. For this reason it is described as a new form rather than as a new variety.

Enteromorpha bulbosa f. **foliacea** form. nov. (Fig. 3)

Thallus subtilis, axe primario compresso, numerosis brevibus frondosis complanatis proliferationibus praeditus, basi attenuato, apice conspicue obtuso; cellulis non in series dispositis, parvis, 5–16 μ diametro, pro more 8–10 μ, 15 μ altis; membrana 22 μ crassa, a parte interiore 5 μ crassis, a parte exteriore vix crassatis; chloroplaston cellulam complens.

Plants fine, main thallus compressed and beset with numerous short, leafy, flattened proliferations, attenuate at the base and markedly obtuse at the apex; cells not arranged in rows, small, 15–16 μ diameter av. 8–10 μ, 15 μ high; membrane 22 μ thick, walls 5 μ thick on the inside but scarcely thickened on the outside; chloroplast filling the whole cell.

American River, R. I. Adelaide, South Australia. Type specimen in herb. Auckland Institute and Museum.

I am indebted to Dr. B. Womersley of Adelaide for the opportunity of examining this form. From the general character of the thallus, cell structure, cell size and membrane it clearly belongs to *E. bulbosa*, but the very characteristic proliferations are quite unlike the normal branches. I am not certain whether these proliferations are a result of the type of habitat in which the plant is growing. Because there is this distinct possibility I have preferred to regard it as a form rather than as a variety.

CHAETOPHORACEAE: ULOTRICHALES.

Sporocladopsis novae-zelandiae sp. nov. (Fig. 4)

Plantis minutis, epiphyticis, constantibus e prostrata serie 1 cellulam crassa, e qua oriuntur filamenta simplicia erecta; filamentis ad 40, pro more 20–25 cellulas longis; cellulis 5.5–7.5 μ latis, 1½–2½-cies longioribus quam latioribus; sporangiis sessilibus vel in culmo unicellulari gestis, per totum prostratum thallum distributis vel gestis, magis minusve secunde in filamentis erectis vel terminalibus in filamentis erectis, 9.3–11.3 μ latis, 17–22.5 μ longis, per foramen apicale dehiscentibus.

Plants minute, epiphytic, consisting of a prostrate layer one cell thick from which simple, erect filaments arise; filaments up to 40 cells long, average 20–25 cells; cells 5.5–7.5 μ wide; 1½–2½ times as long as broad. Sporangia sessile or borne on a unicellular stalk, distributed over the entire prostrate thallus or borne more or less secundly on the erect filaments or terminal on erect filaments, 9.3–11.3 μ wide, 17–22.5 μ long, dehiscing by an apical pore.

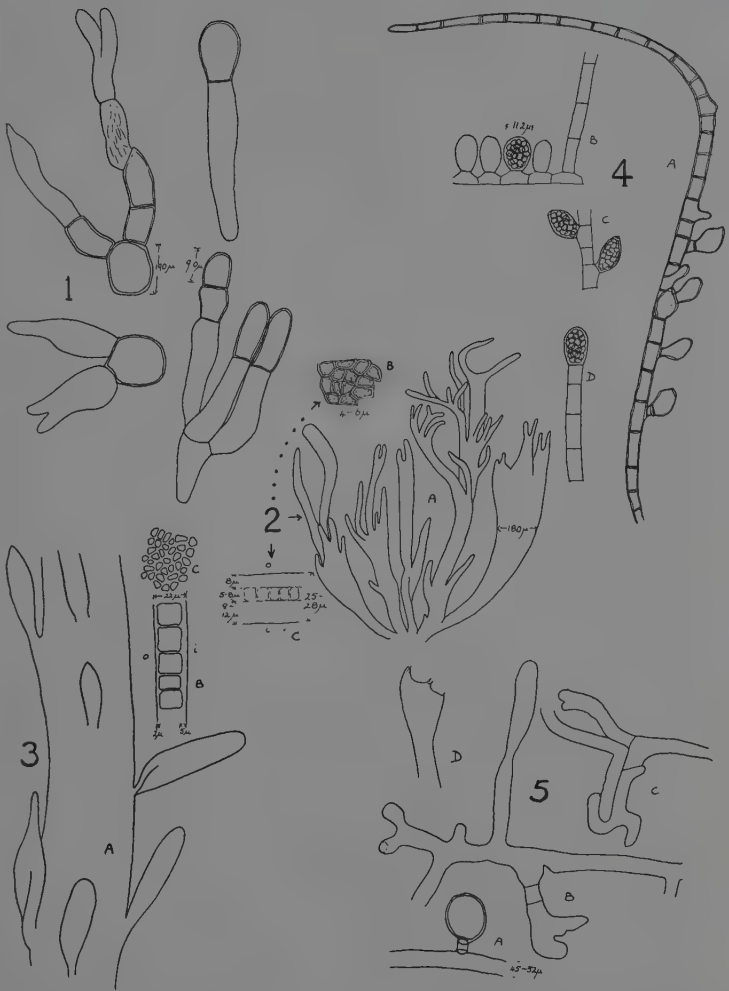

Fig. 1. *Wittrockiella salina.* Representative plants, all to same scale.

Fig. 2. *Enteromorpha minima* f. *fastigiata.* **A,** part of the plant. **B,** cells in surface view. **C,** section through the thallus; "o" is outer wall, "i" inner wall of membrane.

Fig. 3. *Enteromorpha bulbosa* f. *foliacea.* **A,** part of thallus. **B,** section of thallus to show membrane. **C,** cells in surface view.

Fig. 4. *Sporocladopsis novae-zelandiae.* **A,** erect filament with sporangia. **B,** prostrate thallus with sporangia and erect thread. **C,** sporangia with apical pore. **D,** short erect filament with terminal sporangium. (All to same scale).

Fig. 5. *Derbesia novae-zelandiae.* **A,** stalked sporangium. **B,** part of thallus. **C,** appressed arms of thallus. **D,** appressed arm removed to show hooks. (All to same scale).

Epiphytic on Pachymenia and Carpophyllum, Bay of Islands, New Zealand. Type specimen in herb. Auckland Institute and Museum.

This is a very characteristic species and it clearly belongs to the Chaetophoraceae. In some respects it is not unlike certain species of Pilinia e. g. *P. morsei*, but the development of terminal and lateral sporangia on the erect filaments as well as from the prostrate portion suggest its affinities more properly lie with the genus Sporocladopsis described by Nasr [1] from Egypt. It does not agree with any of the known species of this genus. With the discovery of this species in New Zealand there is a discontinuity in the genus but this may be more apparent than real. The plants are minute and could well be overlooked, especially if they did not occur in abundance. Subsequent search may show that the genus is more widely spread in the Indo-Pacific. Search should certainly be made for it in Australia and Tasmania.

CHLOROPHYCEAE: SIPHONALES.

Derbesia novae-zelandiae sp. nov. (Fig. 5)

Thallo e filamentis coenocyticis constante, irregularitis vel dichotomis ramosis; filamentis 37–52 μ latis; generatione asexuali per zoosporangia 95–102 μ lata, 120–150 μ longa, lateraliter gesta in uno culmo cellulis ornato; membra ad generationem sexualem abesse videntur.

Thallus composed of coenocytic filaments, branching irregular or dichotomous; filaments 37–52 μ wide; asexual reproduction by means of zoosporangia 95–102 μ wide and 120–150 μ long, borne laterally on a single celled stalk; sexual reproductive organs apparently absent.

On *Corallina officinalis* in rock pools, Milford, Narrow Neck, Auckland, New Zealand. Type specimen in herb. Auckland Institute and Museum.

This species is somewhat smaller in its measurements than *D. marina* (*D. tenuissima*) but is rather larger than *D. vaucheriformis*. Apart from these differences, however, one of the most interesting features is the tendency of certain portions of filaments from the same or adjacent plants to become appressed to one another (Fig. 5) and to be held in position by minute appendages. This may represent a degenerate form of sexual reproduction though no evidence has been seen of zygote formation.

I am grateful to Mr. L. W. Crawley for the latin diagnoses.

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[1] Nasr, A. H. 1947. Synopsis of the Marine Algae of the Egyptian Red Sea Coast. Bull. 26, Fac. Sci. Fouad 1. Univ. Cairo p. 25.

THE NEW ZEALAND SPECIES OF BOSTRYCHIA RELATED TO BOSTRYCHIA SCORPIOIDES MONT.

R. F. DE BERG

Hooker (1855, 1867) described from New Zealand two species of Bostrychia which he placed close to the European *Bostrychia scorpioides* Mont., viz. *B. harveyi* Mont. and *B. distans* Harv.

However, Post (1936) in her monograph on the genus Bostrychia, united *B. harveyi* Mont. with *B. scorpioides* Mont. stating "*B. harveyi* und *B. scorpioides* sind in allen Merkmalen identish". *B. distans* she still regards as distinct but reduces it to a form of *B. scorpioides* Mont. separating it from the main species chiefly by its poorer branching and fresh water habitat.

In New Zealand *B. scorpioides* (as defined by Post) is widely distributed occurring on rocks, fallen stumps and bases of plants in either the littoral region of tidal flats and estuaries, or immersed in fresh water streams. From a consideration of many specimens collected from a wide range of habitat conditions, it appears that all the New Zealand forms are very closely related, but differ sufficiently from the European *B. scorpioides* Mont. to be separated specifically from it. It is suggested that the name *B. harveyi* Mont. be revived for the New Zealand plants.

B. harveyi was first described by Montagne from plants collected in Chile. The present author has not had an opportunity of examining plants from South America, but there are New Zealand specimens in the Laing herbarium (Canterbury University College) * determined by Troll as *B. harveyi*, presumably after comparison with authentic material.

In *B. scorpioides* (Fig. 3) the frond is composed of polysiphonous filaments consisting of a central siphon surrounded by several rows of pericentral cells. Longitudinally there are two pericentral cells to each central cell. The pericentral cells may be naked (ecorticate) or, by anticlinal and periclinal divisions, may give rise to one, or several, outer layers of smaller rectangular cells (corticate).

The main difference between *B. scorpioides* Mont. and the New Zealand plants is that in the European plant, cortication of the pericentral cells occurs within 50–100 μ of the tips of all the branches while, in the New Zealand plants, except in the encurled apical branchlets, cortication takes place many millimetres from the tips, so that most of the ultimate branchlets are ecorticate. The early cortication produces a much more robust plant, and thus the New Zealand plants are always more slender than the European.

Another striking difference is afforded by the position of the cystocarps. In *B. scorpioides* Mont. they are terminal (Newton pp. 333-4), but in

* At present the Laing herbarium is on temporary loan to the Auckland University College.

material from little Barrier Island and Helensville (collected by Miss L. B. Moore, 1941 and 1944) the cystocarps are lateral in position. Apparently these two collectings are the first (and only) cystocarpic material that has been found in New Zealand.

Within New Zealand the individual plants of *B. harveyi* show considerable variation in the texture of their fronds, but of importance in comparison with *B. scorpioides* is the fact that the more slender forms show no fundamental change in structure, e. g. there are no great differences in the degree of cortication in the different specimens. To some extent the range of variability appears to be correlated with the salinity of the water in which they grow. In general, the fresher the water the more slender and delicate will be the fronds. The plant occurs most commonly in brackish water, particularly tidal estuaries, where the salinity can vary greatly, so that often no true line can be drawn between salt and fresh water habitat. Nor can all the specimens be separated readily into "salt" and "fresh" water forms. It is therefore preferable, although the extreme fresh water forms are quite distinct, to retain all the different variations within the same species and to separate the extreme fresh water forms as ecad *distans*.

Bostrychia harveyi Mont. (Fig. 1)

Plants dark purple, tufted, composed of very short, stoloniferous filaments attached by small holdfasts and giving rise to erect fronds 3–8 cms. long; erect fronds filiform, angularly flexuous, 3–4 pinnate; branching alternate at the base but subdichotomous at the apices of the main axis and branches: branches distichous, spreading 10–25 mm. long, 100–200 μ in diameter and clothed with simple or pinnate branchlets 3–7 mm. long: apical branchlets 3–5, shorter and stouter than the main branchlets and with incurled tips; axial cells normally surrounded by 6 rows of pericentral cells, rectangular in surface view, 20–25 μ by 15 μ; cortical cells square in surface view 15–20 μ diameter; haptera often numerous, arising as proliferations from the pericentral cells, mainly at or near the points of branching: tetrasporangial stichidia linear-oblong, acute, 140 μ in diameter and 450–500 μ long, apical (usually) or intercalary; cystocarps globose, approximately 240 μ in diameter, borne laterally ½–1 mm. from the tips of the branchlets.

Marine and brackish waters.

North Island: "Bay of Islands, Island Bay, Wellington, Coromandel, Kawhia, Paterson's Harbour, Auckland;" (Post, 1936, p. 39); "Kaipara; Kerikeri; Oronga Bay; Mick's Creek — Warkworth." (Post, 1938, p. 210); Helensville, Porirua Harbour, Waikanae (L. B. Moore).

South Island: "Kaipai, Banks Peninsula, Avon, Brighton, Heathcote, Warrington, Long Bay, Invercargill, Purakino;" (Post, 1936, p. 39); Collingwood Estuary (L. B. Moore).

Stewart Island: Native Island — Patterson Inlet (L. B. Moore); Price's Bay (V. W. Lindauer).

Probably widely distributed throughout the Dominion.

Bostrychia harveyi ecad **distans** (Harv.) comb. nov. (Fig. 2)

Similar to *B. harveyi*, but with more slender fronds and fewer branches. Apical branchlets 2–3, less encurled than in *B. harveyi*.

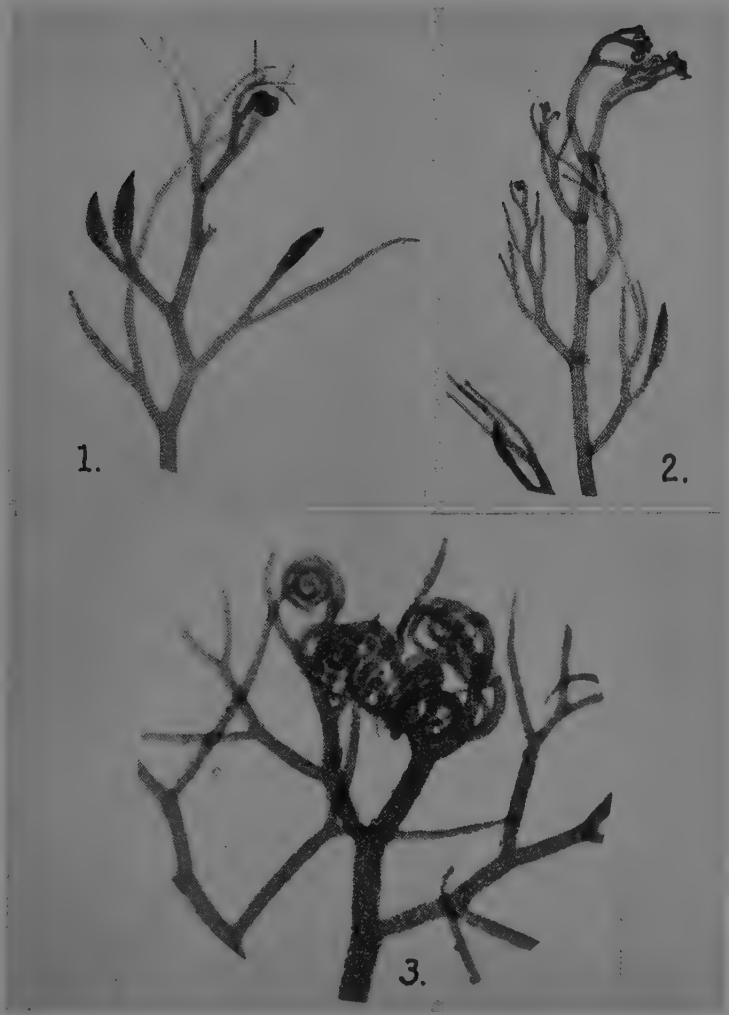

Fig. 1. *Bostrychia harveyi.*
Fig. 2. *B. harveyi* ecad *distans.*
Fig. 3. *B. scorpioides.*
All figs. × 20.

Mainly fresh water.

North Island: Kowhai River, Waterfall — Long Bay (Post, 1936, p. 31); Faraheru Stream — Poverty Bay, Swanson Stream — Auckland (N. J. Butler); Mokaroa Stream — Auckland (J. A. Carnahan); Cannibal Creek — Anawhata (V. J. Chapman); Mick's Creek — Warkworth (L. M. Cranwell); Pig Gully — Cape Brett, Upper Frenchman's Swamp (V. W. Lindauer); Stream — Waipoua Forest (L. H. Millener); Gollan's Stream — Wellington, Happy Valley Stream — Bethells, Little Barrier Island, Orongorongo River, (L. B. Moore).

South Island: Doubtful Sound (L. M. Cranwell and L. B. Moore); Banks Peninsula (Post, p. 37, 1936). Buller Point — Westport (L. B. Moore).

Stewart Island: Stream — Price's Bay (V. W. Lindauer).

Probably widely distributed throughout the Dominion.

The Author wishes to thank the following persons for help in various directions: Miss L. B. Moore and Mr. V. W. Lindauer both for advice and collection of herbarium material; Dr. T. Levring for advice; Dr. M. Parke, Misses A. M. Rodewald, S. A. Rose, Messrs. J. A. Carnahan, and R. M. Innes, and Victoria University College, for collecting of material; Auckland Institute and Museum for the use of herbarium material.

Finally she wishes to thank Professor V. J. Chapman for suggesting the subject and also for advice throughout.

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3(4):503–507 FARLOWIA July, 1949

A STUDY OF ANTIBIOTIC ACTIVITY OF SOME BASIDIOMYCETES[1] [2]

Trent Laviano

My interest in this problem was first aroused in the summer of 1946, after discussing with faculty members of the Mountain Lake Biological Station of the University of Virginia the studies which were made by Wilkins and Harris in England and Robbins and his group at the New York Botanical Garden. Because of the abundance of fungi in the Mountain Lake area of Virginia, this was considered an ideal place to carry on such a study. Parts of the summers of 1946 and 1947 were devoted to this investigation, using the fungi as they became available.

A total of 42 species of Basidiomycetes was investigated, using as test organisms: *Staphylococcus aureus*, *Streptococcus hemolyticus*, *Escherichia coli*, *Mycobacterium phlei*, *Mycobacterium smegmatis* and *Mycobacterium tuberculosis (avian)*.

Staph. aureus and *E. coli* were grown in nutrient broth for 24 hours at 37° Centigrade and then plated with nutrient agar.

Strep. hemolyticus grown in Trypticase Soy broth for 24 hours at 37° C. was plated with Veal Infusion Agar.

M. phlei, *M. smegmatis* and *M. tuberculosis* (*avian*) were individually streaked on nutrient agar plates and incubated for 24 hours at 37° C. The growths were washed off the agar, using Trypticase Soy broth, and the washings were plated with Veal Infusion Agar and again incubated for 24 hours at 37° C.

The methods employed were:

I. Crude extracts (obtained by squeezing mushrooms through gauze) were placed in uniform porcelain cylinders, size 6.0 mm. in diameter.

II. Pieces of mushrooms of uniform size, which were kept as free from bacterial contamination as possible, were plated against the organisms. This was done by peeling off the cuticle of the pileus, then passing a sterile cork borer, 0.7 cm. in diameter, through the mushroom and cutting off the gills with a flamed knife.

III. Alcohol extracts of mushrooms: Small pieces of mushroom were placed in alcohol (95%) and allowed to stand for three to four days and then allowed to evaporate at room temperature. The resulting residue was dissolved in .85% saline and placed in porcelain cylinders.

IV. Acetone extracts, using the same procedure as above.

[1] This study was partially financed by grants made by the Committees on Research of the University of Virginia and the Virginia Academy of Science.

[2] I wish to express my appreciation to Dr. George McL. Lawson, head of the Department of Bacteriology and Preventive Medicine of the University of Virginia for his many suggestions and for the use of his bacteriological equipment; also to Dr. Rolf Singer, assistant curator of the Farlow Herbarium of Harvard University, for the identification of the fungi and advice in mycological questions.

All the above methods were not tried on every species. Only in a few instances were alcohol and acetone extracts tested. These showed positive results, but because of the lack of time and assistance it was not feasible to carry on a detailed study of these methods.

The 27 fungi which showed no bacteriostatic activity are as follows:

Agrocybe semi-orbicularis (Bull. ex Fr.) Fayod ex aut.
Amanita rubescens (Pers. ex Fr.) Gray
Armillariella mellea (Fl. D. ex Fr.) Karst.
Boletinus pictus (Peck) Peck
Clavariella formosa (Pers. ex Fr.) Sing. (*Clavaria formosa* Pers. ex Fr.)
Cortinarius armillatus (Fr.) Fr.
Cortinarius torvus (Fr.) Fr.
Gomphus floccosus (Schwein.) Sing.
Hericium caput-ursi (Fr.) Banker
Hygrocybe sp.
Laccaria ochropurpurea (Berk.) Peck
Laccaria laccata (Scop. ex Fr.) Berk. & Br.
Lactarius piperatus (L. ex Fr.) Gray
Lactarius quietus (Fr.) Fr.
Leccinum albellum (Peck) Sing. (*Boletus albellus* Peck)
Naematoloma sublateritium (Fr.) Karst. (*Hypholoma perplexum* Peck)
Phylloporus rhodoxanthus (Schwein.) Bres. ssp. *Americanus* Singer
Pluteus cervinus (Schaeff. ex Secr.) Quél.
Poria sp.
Psathyrella hydrophila (Bull. ex Fr.) Sing.
Russula densifolia (Secr.) Gillet
Russula emetica (Schaeff. ex Fr.) Pers. ex Gray *sensu lato*
Strobilomyces floccopus (Vahl ex Fr.) Sacc.
Tylopilus alboater (Schwein.) Murr.
Tylopilus felleus (Bull. ex Fr.) Karst.
Tyromyces Spraguei (Berk. & Curt.) Murr. (*Polyporus Spraguei* Berk. & Curt.)
Xeromphalina campanella (Batsch. ex Fr.) Kühn & Maire (*Omphalia campanella* Batsch. ex Fr.) Quél.

Ten of the fungi showed slight bacteriocidal activity on *Staph. aureus*. Each was tested two to three times and showed a clear area within and around the cylinders varying from 0.9 cm. to 1.2 cm. These fungi are:

Boletus edulis Bull. ex Fr.
Boletus sp. (sect. Luridi)
Cantharellus cibarius Fr.
Clavariella botrytis (Pers. ex Fr.) Sing. (*Clavaria botrytis* Pers. ex Fr.)
Craterellus cornucopioides (L. ex Fr.) Pers.
Craterellus lutescens Fr.
Lactarius volemus Fr.
Omphalotus olearius (D.C. ex Fr.) Fayod (*Clitocybe illudens* (Schw.) Sacc.)
Russula cyanoxantha (Schaeff. ex Schwein.) Fr.
Tremellodendron candidum (Schwein.) Atk.

Five of the fungi showed consistently good results. They are as follows:

Cortinarius sp.[3]
Dentinum repandum (L. ex Fr.) Gray (*Hydnum repandum* L. ex Fr.)

[3] A specimen of this fungus was examined by Dr. A. H. Smith of the University of Michigan, who declared it to be an undescribed species of the genus Cortinarius.

Hydnum Murrillii (Banker) Sacc.
Lactarius deceptivus Peck
Russula foetens Pers. ex Fr. (mostly var. *Laurocerasi* (Melzer) Sing.)

The above five species, which showed consistently good results, were tried in different ways against all six organisms previously mentioned. No fungi other than these five were tested against the genus Mycobacterium.

Hypomyces chrysospermum (Bull. ex Fr.) Tul. *(Sepedonium* stage), an imperfect Ascomycete grows on many of the Boletaceae in the area. It was thought advisable to culture this fungus; consequently, cultures were grown on Sabaraud's medium at room temperature. After four days there was an abundance of growth on the medium. A loopful of agar, on which the mycelium of this fungus was growing, was placed on three plates, each plate containing respectively: *Staph. aureus, Strep. hemolyticus* and *E. coli.* These plates were incubated for 24 hours at 37° C. No bacteriostatic action was noted in any of the three plates. It was therefore concluded that this parasitic fungus was not responsible for any of the positive results which were obtained.

The possibility that the antibiotic activity shown by these Basidiomycetes may be the result of saprophytic or parasitic organisms growing within their carpophores cannot be disregarded; however, work done by other investigators in this field indicates that antibiotic activity is inherent in the Basidiomycetes.

The following table summarizes the antibiotic activity of the five fungi on which most of the work was done against the six organisms. The measurements were taken to include the width of the cylinder or the pieces of fungi. Plus and minus signs are used to denote the degree of antibiotic activity, minus signs meaning no antibiotic activity and the plus signs meaning as follows:

+ 1.0 to 1.4 cm. of clearing, ++ 1.5 to 1.9 cm. of clearing, +++ 2.0 to 2.4 cm. of clearing, ++++ 2.5 to 3.0 cm. of clearing.

Using the Taylor Colorimeter, pH determinations were run on the extracts of the five previously mentioned fungi in an effort to determine whether or not the inhibition of bacterial growth resulted from an acid environment. The following results were obtained: *Russula foetens* pH 6.0, *Dentinum repandum* pH 6.3, *Hydnum Murrillii* pH 5.2, *Lactarius deceptivus* pH 5.6, *Cortinarius* sp. pH 5.5.

Since all these pH values are on the acid side, the next procedure was to bring the fungi up to neutrality in order to determine whether or not there would be any appreciable change in their ability to inhibit bacterial growth. Pieces of mushroom were soaked in sterile N/20 NaOH, the excess wiped off on sterile filter paper, and plated against the six different bacteria. There were no differences in the results so it was concluded that the hydrogen-ion concentrations of the mushroom juices were not the primary factors in preventing bacterial growth. The results shown in the

Organism	*Staph. aureus*		*Strep. hemolyticus*		*E. coli*		*M. phlei*	*M. smegmatis*	*M. tuberculosis (avian)*
Method	Extract	Piece of Fungus	Extract	Piece of Fungus	Extract	Piece of Fungus	Piece of Fungus	Piece of Fungus	Piece of Fungus
Russula foetens	++	++	++	++	−	−	+	++	++
Dentinum repandum	++	+	+	+	−	−	+	−	+
Hydnum Murrillii	+++	+++	+++	+++	−	*	+++	++	++
Lactarius deceptivus	++	+	+	+	−	−	−	−	−
Cortinarius	++	+++	++	+++	++	++++	+++	−	+

* On two occasions inhibition was observed, but in these instances extract was not tried.

preceding table include those results obtained with alkali soaked mushrooms.

A total of 134 inoculations were made in an attempt to culture these fungi. The media consisted of Malt extract agar, Potato dextrose agar, a modified Czapek-Dox agar, [4] and soil agar. All attempts were unsuccessful.

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[4] After Wilkins and Harris.

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